THE INDEPENDENT GUIDE TO IBM PERSONAL COMPUTERS

Volume 3 Number 22
$2.95

November 13, 1984

PC NEWS: IBM'S COLOR BOARDS

The New Era: IBM's Breakthrough PC AT

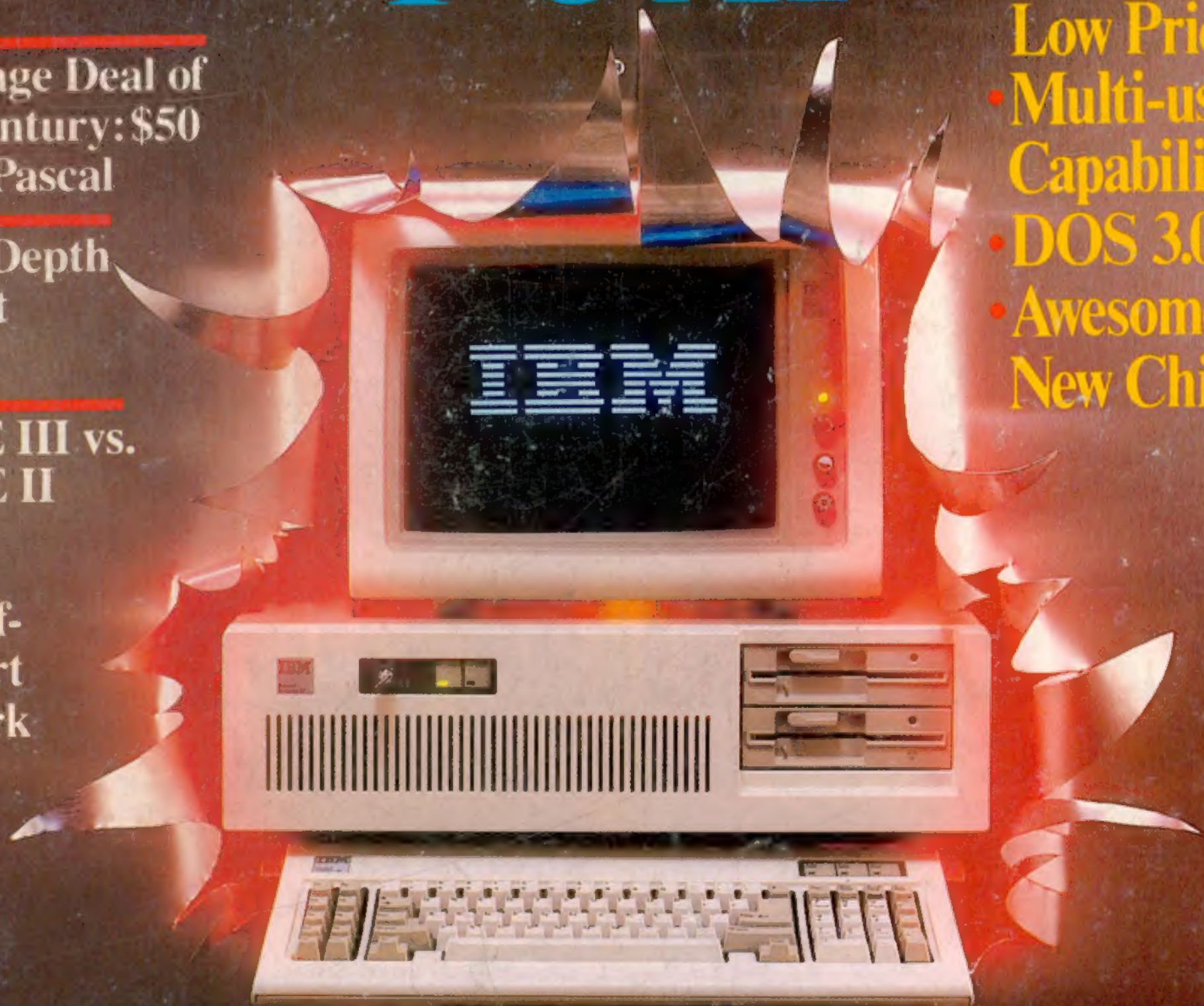
- Trend-setting Low Price
- Multi-user Capability
- DOS 3.0
- Awesome New Chip

Language Deal of The Century: $50 Turbo Pascal

An In-Depth Look at PC/IX

dBASE III vs. dBASE II

IBM's State-of-The-Art Network



PC Exclusive! GOLDENGATE: Amazing Micro-Mainframe Link

IBMs on the Air: CBS & PCs Keep an Eye on the Election

46
0 14024 14355

The power behind your PC is right behind this page.

UCSD Pascal Goes DOS

Now you can penetrate the expanding world of MS*-DOS and PC-DOS while writing applications in the language programmers love:

UCSD Pascal*. The original. The fully-developed industry standard. Complete with extensions for system development and commercial applications programming.

Now you can write programs in UCSD Pascal and execute them under the control of PC-DOS and MS-DOS. Without fuss or complications.

It's made possible by SofTech Microsystems, creators of the microcomputer development environment praised by novice and professional programmers alike. Now you can capitalize on today's emerging standards with tommorow's technology. Our completely integrated environment offers you sophistication, coupled with ease of use. And it's modular, expanding to fit your needs.

Start with the basics: UCSD Pascal, a complete set of development utilities; a full-screen, full-function editor and a file manager.

Add another language. Or two. Such as FORTRAN-77 or BASIC. Our compilers generate compact code and are truly integrated with the development environment.

Edit with ease. When an error is detected, the editor may be invoked and positioned at the statement in error.

You can also write in smaller program segments. This simplifies debugging and testing and lets you use common procedures in multiple applications. Even if they were written in one of our other languages.

For professional developers, we also offer a full set of productivity tools such as assemblers and a symbolic debugger.

And there's more.

Our Insight Window Designer*, for instance, allows you to write windowed applications that include help screens, pick lists, data entry and more in a rainbow of colors.

Clip and mail the coupon below. Or call us at 619/451-1230. We'll send you information on the extensive line of SofTech Microsystems' products.

You'll find that UCSD Pascal goes MS-DOS. And a lot of other places besides.

SOFTECH MICROSYSTEMS

*Insight Window Designer is a trademark of SofTech Microsystems, Inc.

UCSD Pascal is a registered trademark of The Regents of the University of California.

MS is a trademark of Microsoft Corp.

Name: _____

Title: _____

Company: _____

Address: _____ State: _____ Zip: _____

City: _____ ( ) _____

Telephone: (

Area of Activity:

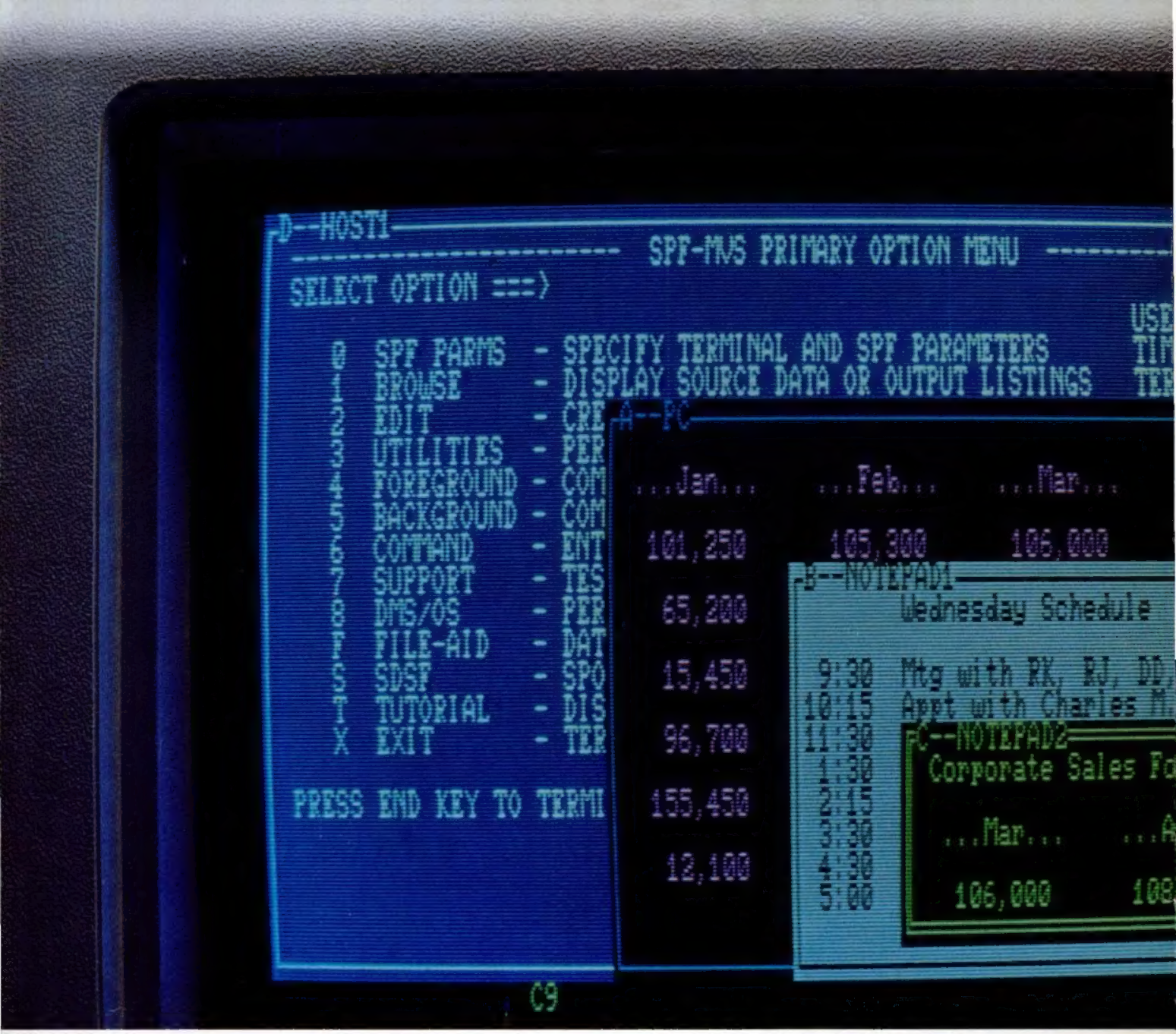
- ☐ Commercial developer
- ☐ Fortune 1000
- ☐ Retailer
- ☐ Educator
- ☐ Other _____

Mail To:
End User Sales
SofTech Microsystems, Inc.
16875 West Bernardo Drive
San Diego, CA 92127

DOS

CIRCLE 122 ON READER SERVICE CARD

Copyrighted material



Compared to this, other 3278/79 emulators aren't much to look at.

Copyrighted material

Look closely.

This isn't your everyday 3278/79 emulator. Ours gives you much more to work with. Namely, a host session, a PC DOS session and two notepads. All on the same screen. At the same time.

We call it the CXI 3278/79 PLUS PC connection.

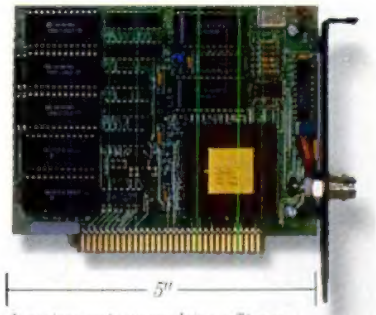
Fortunately, it's easier to use than it is to say.

There's no toggling back and forth between sessions. No shuffling floppies to move information.

The 3278/79 PLUS turns an IBM® PC, XT or compatible into a 3278 or 3279 terminal. Plus a lot more. So now everyone can have the most current data at their fingertips. In a format they all can use.

It comes in two versions. Either a coaxial or modem connection. And both versions provide fast, easy file transfers between a PC and a CMS or TSO host. There's even a batch file generator that serves up multiple files with just a few keystrokes.

And for your colleagues overseas, international keyboard mapping comes standard.



A custom gate array lets us fit our 3278/79 emulator on a 5" board and still offer more capability than all the rest.

But perhaps the biggest advantage of our emulator board is its small size. It's just five inches long. (Or short, depending how you look at it.) Which means it fits conveniently into a PC's short expansion slot. Leaving the long slots for the rest of the world.

For those who need additional host sessions, we also offer the CXI 3270 PC connection. It displays five host applications, a PC DOS program and two notepads—simultaneously.

All our CONNECTWARE™ products are available on a 30-day free trial basis. So for a closer look, call 800/221-6402. In California, call 415/424-0700. Or write CXI, Inc., 3606 West Bayshore Road, Palo Alto, CA 94303. Telex 821945.

Because compared to our 3278/79 emulator, there is no comparison.

CXI

CONNECTWARE is a trademark of CXI, Inc. IBM is a registered trademark of International Business Machines Corp. ©1984, CXI, Inc.

CIRCLE 136 ON READER SERVICE CARD

Copyrighted material

FAST SIDEWAYS PRINTING FOR YOUR EPSON

Now you can print multi-page **spreadsheets** or reports as wide as you like on your FX printer, **sideways** on your paper, in a choice of five different type sizes, at **full text-mode speed.** And you can print in super-fast two-pass dot-matrix **letter quality**. Or create a printer buffer of up to 32K.

Printer Boss™ software also allows full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Select** and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. **Emulate** the IBM-label printer for the IBM-PC, eliminating character printout incompatibilities between IBM-PC software and Epson FX printers while retaining full printer versatility. **Download** to FX printers five different **IBM character sets,** including graphics symbols, greek symbols, screen and APL characters. Print at full text-mode speed. **Ideal** for **IBM graphics** software, or **screen dumps,** or printing text from **Wordstar, Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles $59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option $99.95. With both $139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS, A TRADEMARK OF FUNK SOFTWARE. PRINTER BOSS, LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION. WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT'L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY.

The Independent Guide to IBM Personal Computers

PUBLISHER	Jeff Weiner
EDITOR	Bill Machrone
EXECUTIVE EDITORS	Mike Edelhart, Paul Somerson
MANAGER, COPY EDIT	Anne Freed
MANAGING EDITOR	Barry Owen
TECHNICAL EDITOR	Craig L. Stark
ASSISTANT MANAGING EDITOR	Gus Venditto
ASSOCIATE EDITORS	Jennifer de Jong, Barbara Krasnoff, Stephanie Stallings
TECHNICAL ASSISTANT	Michael O'Cone
PRODUCTION EDITOR	Paul Ross
WAR ZONE CORRESPONDENT	Ruth A. Saperstein
ASSISTANT EDITORS	Jean Atelsek, Charles Bermant, Victoria Danoff, Virginia Dudek, Nina Kirschner, Lisa Kleinman, James Langdell, Janet Lewis, David Obregón, Fredric Paul
EDITORIAL ASSISTANTS	David Baker, Cheryl Goldberg, Jane Mintzer, Roz Tobias
OFFICE MANAGER	Iris Knittel
PROOFREADERS	Gerald Carney, Michael Espindle
CONTRIBUTING EDITORS	Richard Aarons, Frank J. Derfler, Jr., Will Fastie, Posy Gering, Glenn Hart, Stephen Manes, Peter Norton, Martin Porter, Winn L. Rosch, Corey Sandler, Craig Stinson, Jared Taylor, Robin Webster
EXECUTIVE ART DIRECTOR	Mitch Shostak
ART DIRECTORS	Mary Zisk, Gerard Kunkel
ART EDITOR	Mariano Nicieza
DESIGNER	Marjorie Crane
ASSISTANT ART DIRECTORS	Rosalyn Migdal, Louise White
MECHANICAL ARTISTS	Monique Cubicciotti, Ilisa Goodheart, Sara Whitford
PRODUCTION ARTIST	Susan Ahlman
SUBSCRIPTION DIRECTOR	Chet Klimuszko
DIRECT MAIL MANAGER	Eric A. Bernhard
RENEWAL AND BILLING MANAGER	Shane Boel
MEDIA MANAGER	Ann Pichette
SPECIAL SUBSCRIPTION SALES	Daniel Rosensweig
ADVERTISING DIRECTOR	Eugene Duncan
DISTRICT MANAGERS	
NORTHERN CALIFORNIA and NORTHWEST	David Riegler (415) 598-2290
SOUTHERN CALIFORNIA	Barbara Farkas (213) 387-2100
NEW ENGLAND and NEW YORK	Ellen Atkinson (212) 503-5307
MIDWEST	John Hemsath (312) 346-2600
MIDATLANTIC and SOUTHEAST	Bob Ostrow (212) 503-5308
ADVERTISING SALES MANAGER/TELEMARKETING	Pauline Scherer
ACCOUNT REPRESENTATIVES	Jane Anderson, Lisa Kampfmann, Kathy Krochta, Tom Leibacher, Patty Schwartz, Pam Sigal
ADVERTISING COORDINATORS	Helen Forgenie, Scott E. Pearl
ASSISTANT to the PUBLISHER	Suzanne N. Silver
ADVERTISING OFFICE	Ziff-Davis Publishing Company, One Park Avenue, New York, NY 10016 (212) 503-5100
FOUNDER	Anthony Gold

COMPUTER PUBLICATIONS DIVISION

GENERAL MANAGER	Kenneth H. Koppel
SENIOR VICE PRESIDENT	Eileen G. Markowitz
VICE PRESIDENT, EDITORIAL	Jonathan Lazarus
VICE PRESIDENT, LICENSING & SPECIAL PROJECTS	Jerry Schneider
VICE PRESIDENT, CREATIVE SERVICES	Herbert Stern
CIRCULATION DIRECTOR	Alicia Marie Ivans
CREATIVE DIRECTOR	Peter J. Blank
MARKETING MANAGER	Ronnie Sonnenberg
EDITORIAL DIRECTOR	Ernest F. Baxter
BUSINESS MANAGER	Gary A. Gustafson

ZIFF-DAVIS PUBLISHING

President Richard P. Friese; **President, Consumer Magazine Division** Albert S. Traina; **Executive Vice President, Marketing and Circulation** Paul H. Chook; **Senior Vice President** Phillip T. Heffernan; **Senior Vice President** Sidney Holtz; **Senior Vice President** Edward D. Muhlfeld; **Senior Vice President** Philip Sine; **Vice President** Baird Davis; **Vice President** George Morrissey; **Vice President** Rory Parisi; **Vice President** William L. Phillips; **Treasurer** Selwyn Taubman; **Secretary** Bertram A. Abrams

PC: The Independent Guide to IBM Personal Computers ISSN (#0745-2500) is published bi-weekly for $34.97 for one year (26 issues), $61.97 for two years, and $81.97 for three years. Additional postage $44.00 for Canada and all other foreign countries. PC Communications Corp., a subsidiary of Ziff-Davis Publishing Co., One Park Ave., New York, NY 10016. Second-Class postage paid at New York, NY 10016 and at additional mailing offices. POSTMASTER: Address changes to *PC, The Independent Guide to IBM Personal Computers*, P.O. Box 2445, Boulder, CO 80322. **Editorial and Business Office:** One Park Ave., New York, NY 10016. Editorial (212) 503-5255, Advertising (212) 503-5100. For subscription inquiries and service, write to PC Magazine, P.O. Box 2445, Boulder, CO 80322. *PC* is an independent journal, not affiliated in any way with International Business Machines Corporation. IBM is a registered trademark of International Business Machines Corp.

Entire contents Copyright © 1984 PC Communications Corp. All rights reserved; reproduction in whole or in part without permission is prohibited. The following are trademarks of PC Communications Corp.: PC, PC: The Independent Guide to IBM Personal Computers, PC Mart, PC-Lab, PC-Communiques, Project PC, PC Tutor, PC: BlueBook, User-to-User, PC News. **Permissions:** Material in this publication may not be reproduced in any form without permission. Requests for permission should be directed to Jean Lamensdorf, Ziff-Davis Publishing Company, One Park Ave., New York, NY 10016. **Editorial Communications** may be addressed to SOURCE BBB343, CompuServe 71226,713, or MCI Mail 157-9301.

Copyrighted material

The new HERCULES™ Color Card gives you the parallel port IBM® forgot-for $1 more.

The new Hercules Color Card gives you these five important features in a color graphics card.

1. Full IBM color card compatibility.[1] Any program that runs on IBM's color card will run on the new Hercules Color Card at the same resolution.

2. A parallel printer port—standard on the Hercules Color Card, but forgotten by IBM on theirs.

3. It's short. The pint-sized Hercules Color Card fits in the short slot in an XT or *Portable*.[2] And it's AT™ compatible.

4. It can work in your system at the same time as the famous high resolution Hercules Graphics Card.[3] And it will continue to work backed by our 2 year warranty.

5. Low price. At a suggested list price of $245, the Hercules Color Card is only $1 more than IBM's card.[4] And our Graphics Pak™ saves you even more money when you buy both Hercules cards at the same time.

Call **800 255-5550 Ext 420** for the name of the Hercules dealer nearest you. See why the company that made the first graphics cards for the IBM PC still makes the best.

	IBM Mono Display Compatible	IBM Color Display Compatible	Hi-Res Text	720 × 348 Hi-Res Graphics	320 × 200 Color Graphics	640 × 200 B&W Graphics	Parallel Printer Port
Hercules Color Card		▪			▪	▪	▪
Hercules Graphics Card	▪		▪	▪			▪
IBM Mono Card	▪		▪				▪
IBM Color Card		▪			▪	▪	

Hercules. We're strong on graphics.

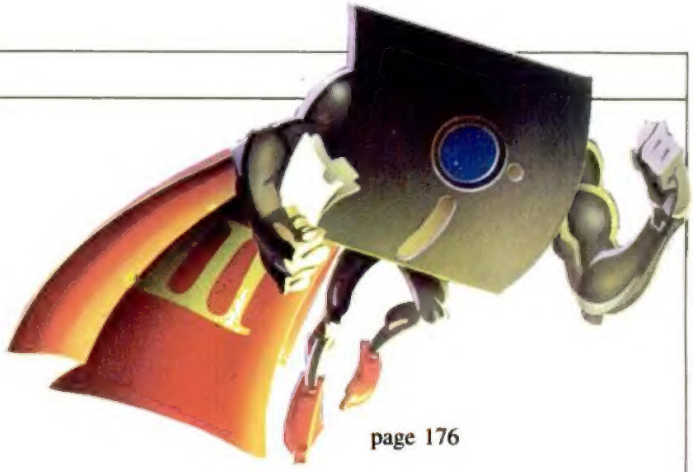
Address: Hercules, 2550 Ninth St, Berkeley, CA 94710 Ph:415 540-6000 Telex:754063 **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; Imagineering/Australia; Holland Info Products/Holland; DataTeam/Scandinavia **Trademarks/Owners:** Hercules, Graphics Pak/Hercules Computer Technology; IBM, AT/ International Business Machines **Notes:** (1) An adapter is supplied for composite video. (2) The IBM Color/Graphics Monitor Adapter must be removed from the *Portable* before the Hercules Color Card is installed. (3) Model GB101 or later. (4) Based on the list price as of 7.1.84 for the IBM Color/Graphics Monitor Adapter.

CIRCLE 145 ON READER SERVICE CARD

Copyrighted material

The Independent Guide to IBM Personal Computers

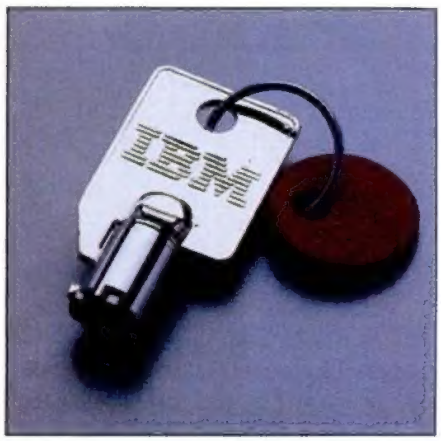
VOLUME 3 NUMBER 22
NOVEMBER 13, 1984



page 176

COVER STORIES

IBM Brings Out the Big Guns . . 116
Paul Somerson/With its new PC AT, IBM is saying "no more Mr. Nice Guy." The AT is so good and so aggressively priced that it will knock IBM's competition right out of the ring. The big difference most AT users will appreciate, at least initially, is speed. Once they are loaded into memory, everything from BASIC programs to expensive applications software runs between two and three times more quickly on the AT than on any other of the IBM micros.



IBM Nurtures a Network 134
Bill Machrone/Among the 20-odd computer networks currently on the market, IBM's PC Network boasts some dramatic differences. It connects up to 72 PCs in a 1,000-mile radius and, with certain additional equipment available from cable TV vendors, can connect up to 1,000 PCs over an area of several miles. What makes this system go? IBM's Network Adaptor card and the PC Network Program, which offer state-of-the-art features unavailable in their entirety in any other network system.

FEATURES

SOFTWARE
A Bridge Between Mainframes and Micros 143
Bill Catchings/Cullinet's *Information Database* package for its *GOLDENGATE* integrated software may be the missing link between mainframes and the PC. *Information Database* brings together not only the mainframe and microcomputer, but also their respective cultures.

Integration at the End of the Bridge 149
Dick Aarons/*GOLDENGATE*, an integrated software package for micros from Cullinet, gathers word processing, database management, spreadsheet manipulation, graphics, file management, and communication into a compact, beautifully documented package that works with *Information Database*, a program that links it to mainframe databases.

Delving into dBASE III 176
Glenn A. Hart/A closer look at *dBASE III* and where it differs from *dBASE II*. Written in the C language, *dBASE III* can be ported to a wide spectrum of computers with considerable ease. The major improvements are in the areas of reduced database constraints, language enhancements, documentation, and speed of execution.

Filebase Rescues Stodgy MailMerge 293
George R. Beinhorn/*Filebase* is a super file-handling utility that turns *MailMerge* into a real correspondence database. It flexes its muscles when pulling selective records out of a file, giving numerous options. It saves records with remarkable RAMdisklike speed and eats up disk space much less quickly than more complex programs.

SPECIAL REPORT
IBM's UNIX Formula for Your PC 159
James R. Groff and Paul N. Weinberg/How the first implementation of UNIX from IBM for the PC adds up.

Project Management with the PC, Part 2 211
We continue our look at Level I project management packages, programs that offer facilities for planning a project and sizing up the required resources.

APPLICATIONS
CBS Makes News with PCs 201
Martin Porter/CBS had an edge in convention coverage—access to political research via on-site PCs.

LANGUAGES
Supercharged Turbo Pascal 276
Jeff Duntemann/A near-perfect applications language, Turbo Pascal is a new concept in programming environments. A compiler for folks who don't have an M.S. in computer science, it achieves an elegance no other language compiler has ever displayed.

Copyrighted material

page 276

page 116

PRO COLUMNS

LAW
PC Takes the Case 325
Thorne D. Harris III/With a PC and a database manager, automated litigation support is within reach of even a solo practitioner.

ENGINEERING
For Chemical Engineers: New PC Software 329
Nicholas Basta/Three new programs for chemical engineers that offer help with tedious problems and enhance design power on a PC.

EDUCATION
Teachers Reach Out and Touch with PCs 335
Randy Elliot Bennet/Educators learn the advantages and pitfalls of using telecommunications in secondary schools.

BUSINESS
Rating Managerial Skill via the PC 339
Harold Goldes/Thoughtware has introduced a program to help you assess and improve your management skills. But can it deliver on its promise?

PROGRAMMING
Fractals and the IBM PC 380
Stephen M. Estvanik/Fractional dimensions, or fractals, can be developed on the IBM PC to measure highly irregular shapes.

TELECOMMUNICATIONS
A Communications Software Primer 402
M. David Stone/Choosing a communications program can be as easy as getting a copy of *PC-TALK III* from a friend, but if you shop around, there's much more to consider.

DEPARTMENTS

WHAT'S INSIDE 15

PC NEWS 33
Twelve pages of up-to-the-minute reports, interviews, minireviews, and useful tips from the computer community.

FROM THE EDITOR'S SCREEN
IBM on Trial 81
Bill Machrone/Is what's good for IBM good for the country?

GUEST EDITORIAL
Training on a Chip 91
Norman D. Kurland/Embedded chips promise to revolutionize job training. One danger is that firms may be tempted to choose the automated aid over the worker.

LETTERS TO PC 93

THE NORTON CHRONICLES
The TopView Phenomenon 105
Peter Norton/IBM's *TopView* windowing system is a truly wonderful multitasking environment with a terrific user interface.

PC ARCADE
Ringside Thrills 311
Corey Sandler/*Championship Boxing* provides the fun and excitement of pro boxing.

BOOK REVIEW
Kids and Computers: All in the Family 319
Robin Raskin/Four different approaches to teaching children about computers.

NEW ON THE MARKET 345
David Obregón/The latest in hardware, software, accessories, and publications.

CLUB NEWS 358
Jane Mintzer/Listings of dozens of IBM PC user groups from Penn State U. to Kalamazoo.

PC BLUEBOOK 360
A quick reference guide for PC owners.

PC:MART 378

USER-TO-USER 384
Paul Somerson/PC owners share their tips and short programs.

PC TUTOR 389
Mark Zachmann/PC answers readers' technical and nontechnical questions about personal computing.

PRODUCT INDEX 397

INDEX TO ADVERTISERS 409

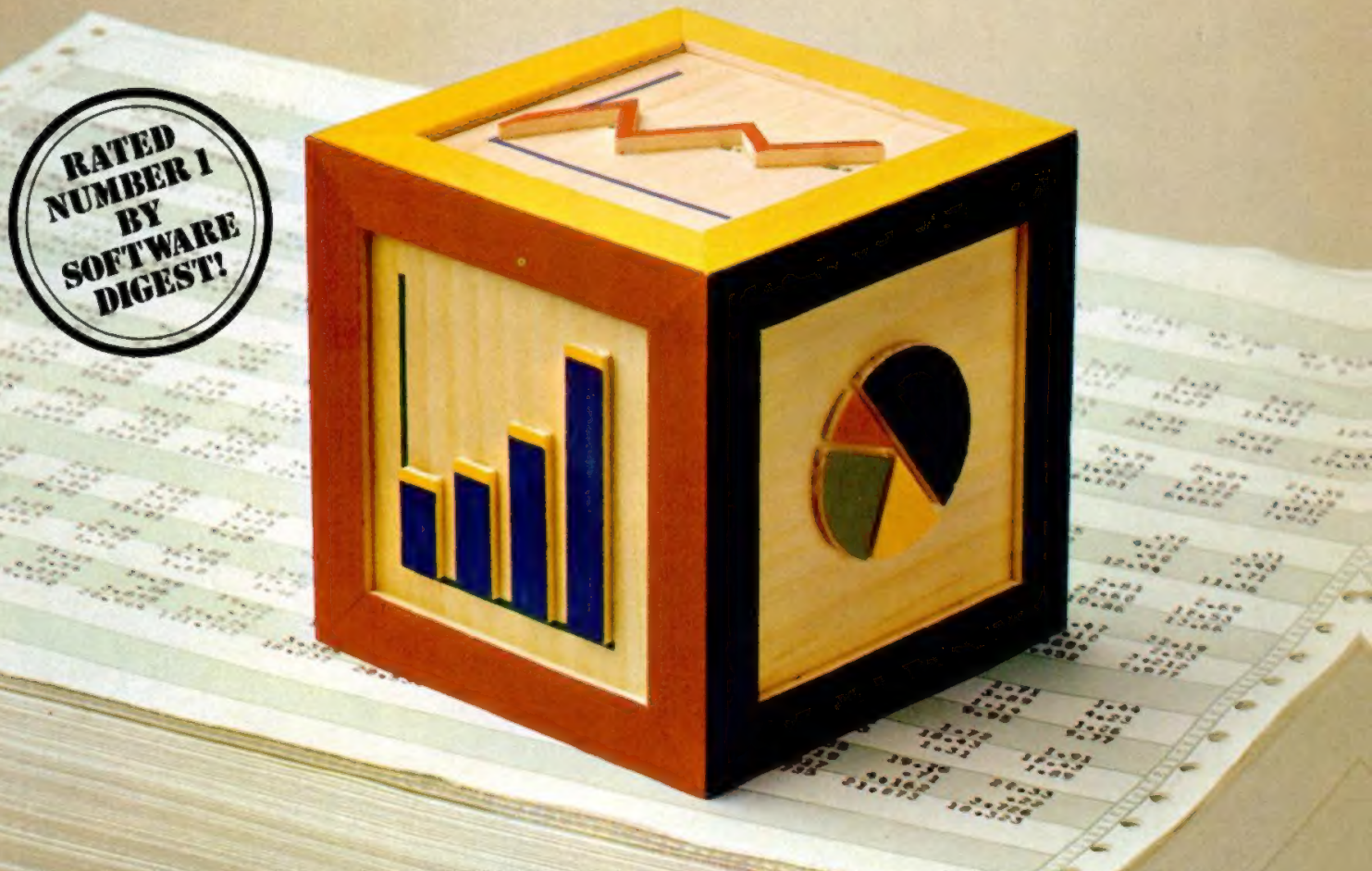
COMING UP
PC Tech Journal 405
PC Disk 406
PC Magazine 411

Cover Photography: Shig Ikeda
Cover Construction:
Nick Aristovulos

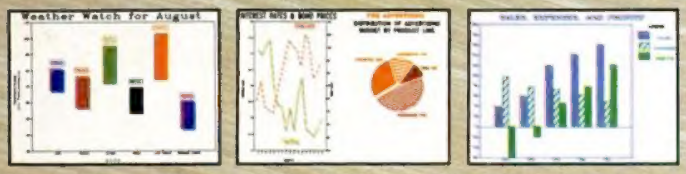
Cover Photography: October 16, 1984 Issue:
Dennis Chalkin

Copyrighted material

Chart-Master™ turns volumes of complex data into easy-to-understand graphics.



"A picture is worth a thousand words." With this simple concept as a building block, Chart-Master is changing the way busy executives, analysts and secretaries look at, interpret and present information. In a fraction of the time required to wade through volumes of printouts, you can



Values printed at data points; both left and right Y-axis scales; floating legends & bars; both horizontal & vertical formats; exploded pie sections.

produce easy-to-understand bar charts, pie charts and scatter diagrams quickly and dramatically. Chart-Master makes it easy to customize reports and presentations with six different fonts, label placement, proportional pie charts and more.

Menu-driven Chart-Master allows you to enter data and select a chart format at the press of a button. You then preview your selection on your personal computer screen as it would appear in final form. Or, you can review the various Chart-Master graphic options to make sure you have selected the most effective format. When satisfied, you can transfer your selection to paper or acetate transparencies for a colorful, presentation-quality chart in seconds.

Chart-Master presents a *clear picture* of the "bottom line," which conveyors of information understand and decision makers appreciate. That's why major corporations like GE, Eastman Kodak, Exxon, Union Carbide, GM, AT&T, DuPont, 3M, Citibank, Motorola, Procter & Gamble, and GTE rely on Chart-Master to translate "volumes of complex data into meaningful information."

Chart-Master supports the IBM Instruments XY750, Panasonic VP Series, Houston Instruments DMP29, Yokogawa PL1000 and Strobe plotters, in addition to the Hewlett-Packard family of plotters, for use with IBM PC and other compatible computers.

The retail price of Chart-Master is $375. For a complete information kit and name of your nearest dealer, contact Decision Resources, Inc., 25 Sylvan Road S., Westport, CT 06880. (203) 222-1974.

CIRCLE 154 ON READER SERVICE CARD

DecisionResources

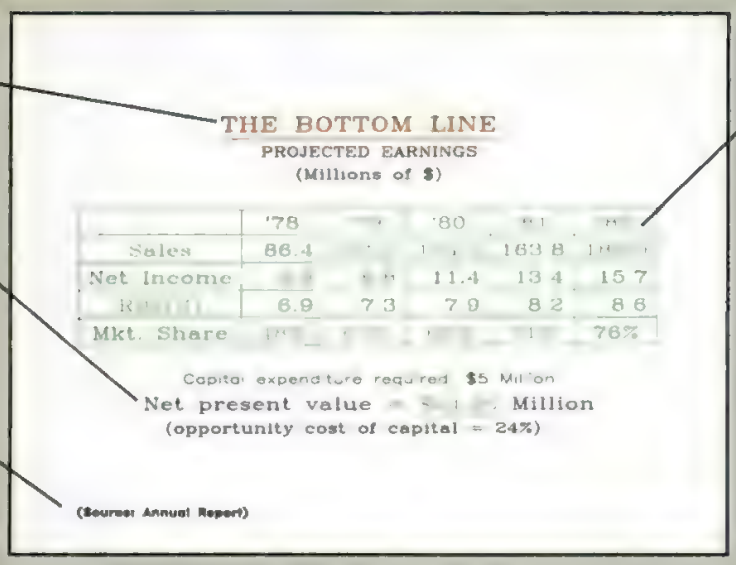
Software Designed for Decision Makers

SIGN-MASTER™
Number 1 in word charts for presentations and reports

Create powerful headlines using SIGN-MASTER's color, size, and font options. Here we chose Bold Roman font.

Highlight a single character, word or an entire line at the touch of a button. Here we focus attention on one number with color and underline.

Indicate source, date, author, etc. with SIGN-MASTER's footnote option. Bold Standard font was used in this example.

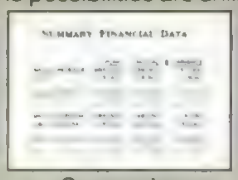


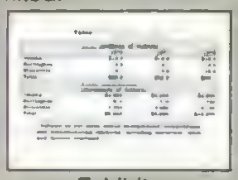
Develop professional tables quickly and easily. Once data and text is entered, SIGN-MASTER determines the spacing and layout.

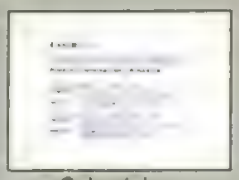
Produce SIGN-MASTER word charts on paper, overheads or slides.

With SIGN-MASTER, the possibilities are unlimited:

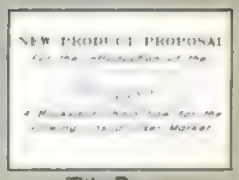
Proposals


Summaries


Exhibits


Schedules

Tables


Title Pages

SIGN-MASTER is the first program designed to allow everyone from top management on down to produce colorful, attention-gaining "word charts" and tables for presentations and reports.

Created on an IBM PC with a compatible plotter or printer, SIGN-MASTER word charts are superior in quality to typing and less expensive than typesetting or printing.

Professional Word Charts Made Easy

In just minutes, this unique menu-driven program lets you create impressive, easy-to-read documents using words, numbers, lines and SIGN-MASTER's simple-to-master Table Mode.

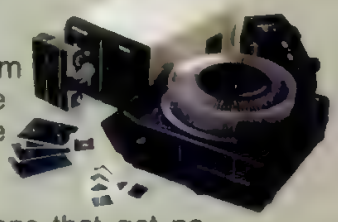
Number 1 in Quality Text

SIGN-MASTER offers the greatest variety of text options. In addition to 6 fonts, 16 sizes and 8 colors, you can justify text, underline, italicize, set margins, spacing, and more.

An Important Presentation Tool

With SIGN-MASTER and any one of over 40 plotters, you can produce full color originals on paper and overheads. The program also works with most popular printers to create the highest quality printer graphics possible.

Make Super Slides Quickly and Economically



Presentation-quality 35mm slides can be created in-house and inexpensively using the Polaroid Palette in conjunction with SIGN-MASTER.

For reports and presentations that get noticed, get SIGN-MASTER — Number 1 in word charts.

The retail price is $245.00. Call or write today for a complete information kit and a demonstration at your nearest dealer. Decision Resources, Inc., 25 Sylvan Road South, Westport, CT 06880 (203) 222-1974

CIRCLE 155 ON READER SERVICE CARD

The developers of CHART-MASTER

DecisionResources

Software Designed for Decision Makers

SIGN-MASTER is a trademark of Decision Resources, Inc. SIGN-MASTER is available through the following international distributors: Grafisk Databehandling (Goteborg) Scandinavia, Telecomputer Micro-Shop (Essen) Germany, Austria, Software Enterprises (Rotterdam) Benelux, Edisoft (Paris) France, Sumlock Bondain (London) U.K., Calcomp S.A. (Milan) Italy and Computerland and Entré Worldwide

Can Your Word Processor Keep Up With Your 100 WPM Typist?

It can if you have WordPerfect!

Try this test. While using your favorite word processor, put the cursor in the middle of a paragraph, turn insert on, and type. Surprisingly, very few of the leading word processors can keep up with 70, 60, or even 50 words per minute. WordPerfect keeps up easily at speeds well above 100*.

Now, maybe this doesn't matter to you, because you don't type 100 or even 50 WPM. But you still don't want to wait forever to go to the beginning of your document, go to page 5, save your document, or add a paragraph.

At SSI anything less than fast is unacceptable. And not just because time is money, or because wasting time is foolish.

Delays are very frustrating, and frustration can easily lower the quality of your writing.

Try WordPerfect.

WordPerfect

You'll love it—not only for the features we've built in, but also for the delays we left out.

*Based on tests performed on an IBM PC.

SATELLITE SOFTWARE INTERNATIONAL

288 WEST CENTER STREET, OREM, UTAH 84057 (801) 224-4000 TELEX 820-618

SSI

CIRCLE 149 ON READER SERVICE CARD

COMPAQ PRESENTS

How To Do More With Less

It used to be that when you wanted personal computers to do more, you added peripherals. A fixed disk for storage. A second monitor for graphics. A backup system for data protection. And slowly the octopus devoured your desk.

But now everything you wanted in a personal computer is *in* a computer. The new COMPAQ DESKPRO™ is here.

There's room *inside* for up to four storage devices. For instance, you could insert two diskette drives, a 10-megabyte fixed disk drive, even an exclusive tape backup system. The new COMPAQ DESKPRO can grow *inside* instead of *out*, saving your desktop.

Plus internal expansion slots will let you add even more functions like local area networking. A mouse. And more.

All that makes COMPAQ DESKPRO the most expandable PC you can buy. And thanks to some ingenious engineering, the COMPAQ DESKPRO displays high-resolution text *and* graphics on one monitor, not two.

It also runs thousands of business programs made for the IBM® PC and *XT* straight off the shelf—a full two to three times faster than older, slower computers. So you can run the most complex software this side of mainframes quicker than you can say, "1-2-3."

We designed the new COMPAQ DESKPRO around the same philosophy that made us the best-selling portable business computer in the world. We simply offer more in less space. For a free brochure or the location of your nearest Authorized COMPAQ Dealer, call toll-free 1-800-231-0900.

COMPAQ DESKPRO™

It simply works better

COMPAQ® is a registered trademark and COMPAQ DESKPRO™ is a trademark of COMPAQ Computer Corporation IBM® is a registered trademark of International Business Machines Corporation © 1984 COMPAQ Computer Corporation

WASHINGTON PRESS
Now IRMA™ can make any printer work with your 3270 network. Well, almost.

When you set up an IBM® 3270 network, you're faced with the fact that you can't just go out and buy any printer to work with it.

Your choices are, to say the least, limited. Even IBM only makes a few that are compatible.

But with new IRMAprint from DCA, the limits are off.

IRMAprint isn't a printer. It's a printer emulator. In technical terms, it hoodwinks the IBM mainframe into thinking that whatever printer attached to it is a 3287.

So now if there's a more economical printer you want to use, use it. If you'd like to plug in a laser printer, plug it in. If you've always wanted to upgrade to a printer with better capabilities, there's never been a better time than now.

You would think that, with all that it does, installing an IRMAprint might prove to be a headache.

It's not.

IRMAprint is installed right at the controller site with a simple standard coaxial cable. And two models of IRMAprint are available for either an RS-232C or Centronics® Parallel Interface.

IRMAprint. It's new from DCA, the makers of the IRMA family of IBM-emulation products.

It lets you choose any printer that's right for the job, instead of the few that are right for the network.

For more information about IRMAprint, or any of the IRMA family of IBM-emulation products, send in the coupon below. Faster still, call 1-800-241-IRMA. Telex 261375 DCAATL.

Mail to 303 Technology Park, Norcross, GA 30092. And we'll tell you more about IRMAprint and all IRMA products.

Name _____

Firm _____ *Title* _____

Address _____

City _____ *State* _____ *Zip* _____

Phone _____

dca
Digital Communications Associates, Inc.

MP-02-08

IRMA and IRMAprint are trademarks of Digital Communications Associates, Inc. DCA is a registered trademark of Digital Communications Associates, Inc. Centronics is a registered trademark of Centronics Data Computer Corp. IBM is a registered trademark of International Business Machines Corporation. © 1984 Digital Communications Associates, Inc.

CIRCLE 444 ON READER SERVICE CARD

The Perfect Match

Davong has a beautiful way to solve both your hard disk storage and backup needs.

Davong combines good looks with hard disk and tape.

Our new DataSystem for IBM® PCs.

We offer a full range of disk sizes, all including a hard disk drive plus tape backup unit. And the capability of using the tape as a start/stop systems device.

In fact, this Davong DataSystem has a lot of other beautiful benefits, too. Like compressed or full-volume backup with file-by-file or full-volume restore. And automatic flaw mapping to ensure complete media interchangeability.

Our full XT compatibility actually offers performance a cut above other XTs. And if you want even higher performance and password protection, you can use our Multi-OS® software.

To top it off, there's the sleek, contemporary styling of our DataSystem. And a low price that's equally attractive.

Davong DataSystem for IBM PC's.

See us at Comdex
Las Vegas, Nov. 14-18
Booth H8606

DAVONG

Davong Systems, Inc.
217 Humboldt Court
Sunnyvale, CA 94089
(408) 734-4900 Telex: 176386

*Multi-OS is a registered trademark of Davong Systems, Inc. *IBM is a registered trademark of IBM Corp.

CIRCLE 219 ON READER SERVICE CARD

What's Inside

PC's editors got to play with two wonderful new toys from IBM—the PC AT and the PC Network, both reviewed in this issue. These toys, and others, caused quite a stir around our offices.

For the most part, the *PC* editorial staff works in a very democratic fashion (within, of course, the usual office hierarchy). It is assumed, for example, that all new staff members are already afflicted with microcomputer mania when they get here or will catch the disease shortly after they arrive.

So, when something exciting finds its way into our hands, it doesn't disappear into the inner reaches of editor Bill Machrone's office, never to be seen again by human eyes. Bill isn't that kind of editor—and he knows that any attempt to abscond with a new plaything would result in instant mutiny, at the very least.

Toys for Us

Bill often is not the first person to get his hands on a new product. That honor is reserved for Paul Somerson, whose total absorption in any new piece of hardware or software is legendary—at least, among us.

Events ran true to form when IBM announced its new PC AT microcomputer. Rumors, of course, had been rife for weeks, and the staff looked somewhat nervously forward to the press announcement that would introduce IBM's latest entry into the microcomputer field.

We were excited enough when the fateful day came and IBM showed the press what a marvelous little machine it

had come up with (for a marvelous little price). However, it became a real red letter day when our editors returned to the *PC* offices to find that IBM had obligingly sent an AT by Federal Express for review so the staff would not have to wait to have a chance to play with it.

AT Mania

The AT was duly set up in Paul's office, and after the first oohs and aahs and the first demonstrations, most of the staff retired to their offices to get back to work. Or so they thought.

Throughout the day, as Paul got to know his new toy, cries of "I don't believe it!" and "Expletive deleted!" were heard from his general direction. Well, no true computer enthusiast could ignore these noises, so, like a flock of birds following a mating call, the entire staff would pile around Somerson's desk to observe the latest trick. As you can well imagine, not a great deal of work got done that day.

Network Mania

Paul was not the only one to play with an impressive IBM toy, however. Bill Machrone also got his chance, with the new PC Network. Although the network won't be available until the first quarter of 1985, and we usually don't review anything until it is on the shelves, Bill was so excited by what he saw at the PC Network press introduction that he couldn't wait to write about it. Since Bill knows about as much about microcomputers as anyone would care to, when he is impressed by a product, you can be pretty sure that it's impressive.

"It had a half-dozen PCs and ATs," he said, bemused, "with a full cable television system, cameras, a remote laser disc player, all running on the same network at the same time!"

SF Mania

And as long as I'm on the subject of Bill Machrone, I may as well mention something else that caused him to get ex-

Photograph: Shig Ikeda

cited recently. I am not giving away any secrets when I say that Bill is a science fiction fan. Like many of our readers, he graduated from reading about fictional computers to playing with real ones.

Well, Bill was reading a new novel, called *Earthchild*, by Sharon Webb, and he happened to notice that one of the people mentioned in the acknowledgments was a gentleman named Jeff Duntemann. This name sounded vaguely familiar to Bill. He searched his memory until he realized that somebody named Jeff Duntemann had written a fine article on Turbo Pascal for this issue of *PC*.

He got on the phone to Jeff and asked if he and the writer mentioned in the book were the same. Jeff laughed and informed Machrone that he was indeed the same person and in fact had several science fiction books to his credit. And we thought Bill had been impressed by the PC Network!

Across the GOLDENGATE

In spite of all our talk about playing with toys, we think of ourselves as a pretty professional bunch. We were gratified to learn that Cullinet Software Inc. thought so too. Cullinet's new *GOLDENGATE* integrated software, which is reviewed in this issue, may well be the long-sought-after bridge between mainframes and micros, and as such, is an important addition to the computer marketplace.

> Cullinet wanted its new product reviewed by people who know the computer field, so they choose PC.

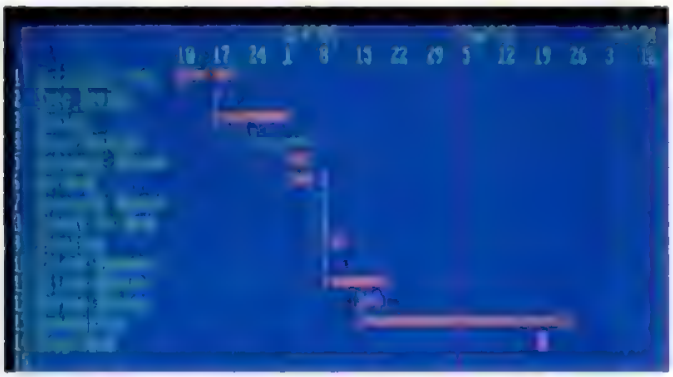
However, the people at Cullinet were a trifle nervous about the best way to enter the micro sweepstakes. Until now, the company had been predominantly a publisher of mainframe software, and it wanted to make sure that its new product would be reviewed by people who really know the computer field. So it isn't surprising that the magazine they chose to introduce *GOLDENGATE* was *PC*.

At least, it wasn't surprising to us. ■

Dealer Inquiries Circle 186 on Readers Service Card
End Users Circle 187 on Readers Service Card.
See us at Comdex — Booth #7245 Hilton

Now there's no excuse to drop dead.

Producing a brochure. Introducing a new product. Moving your entire company across town. Every project has a start date, a completion date, and a date beyond which you absolutely, positively cannot go. The drop dead date. Blow that date and you've got positively, absolutely no excuses.



Better to arm yourself with Microsoft® Project, the new software tool for business managers and their IBM® PCs. Microsoft Project tells you which activities are essential to keeping your schedule. And which you can let slide.

Microsoft Project keeps you on a healthy track.

What a spreadsheet does for financial planning, Microsoft Project does for start-to-completion scheduling. Give it your best to worst "what-if" scenarios. It tells you what must be accomplished. By whom. By when. At what cost.

When management needs detailed status or budget reports, it prints them out. In text and bar charts. And it can also send budgeting information to programs like Multiplan,® Microsoft Chart, or Lotus™ 1-2-3.™

Get Microsoft Project. No excuses.

Microsoft Project is easy to use. Especially if you're familiar with electronic spreadsheets. It saves your company time, work, money. Makes you an on-time, on-budget manager. Not to mention it's from Microsoft. We're the people who designed the MS™-DOS operating system that tells the IBM PC how to think. And our BASIC is the language spoken by nine out of ten microcomputers worldwide.

MICROSOFT®
The High Performance Software

For the name of your nearest Microsoft dealer, please call 800-426-9400. In Washington State, Alaska and Hawaii 206-828-8088.

Should you decide you can face another drop dead date without Microsoft Project, tell us where to send the flowers.

Microsoft and Multiplan are registered trademarks and MS is a trademark of Microsoft Corporation. IBM is a registered trademark of International Business Machines Corporation. Lotus and 1-2-3 are trademarks of Lotus Development Corporation.

Available for the IBM PC, AT, XT, jr, and true compatibles*

CLEAR THE DESK, SIDEKICK'S HERE!

The Super Organizer

ALWAYS JUST A KEYSTROKE AWAY . . .

No matter what software you're running!

WHETHER YOU'RE RUNNING LOTUS, WORDSTAR, dBASE OR WHATEVER . . .

JUST A KEYSTROKE AND A SIDEKICK WINDOW OPENS . . .

- **A CALCULATOR**
- **A NOTEPAD**
- **AN APPOINTMENT CALENDAR**
- **AN AUTO DIALER**
- **A PHONE DIRECTORY**
- **AN ASCII TABLE**

"SIDEKICK IS A $50 SOLUTION TO A $5,000 PROBLEM."

INTRODUCTORY OFFER

$49.95

Copy Protected Version

30 DAY MONEY-BACK GUARANTEE

Here's Sidekick in action. That's Lotus 1-2-3 running underneath. In the Sidekick Notepad you can see data that's been imported from the Lotus screen. On the upper right, that's the Sidekick Calculator.

NOW . . . Whether you're working in dBase, Lotus, Wordstar or whatever . . . you can unleash the full power of your computer . . . and make a lot of extra space on your desk at the same time.

Whenever you're using your computer . . . from start to finish of your session . . . Sidekick™ will be there . . . ready to serve. And it's as lightning-fast and compact as only Borland knows how to make it.

There's a notepad that has a full-screen editor that can time and date stamp your notes, and then save them to disk. You can even pull information into the notepad directly from the screen of your "underlying" software.

Suppose you're working in Lotus and the phone suddenly rings. Give your Sidekick a call and it pops right up over Lotus with the notepad you need. Or an appointment calendar . . . one you can never misplace.

What if you need to do a quick calculation? A keystroke instantly brings up the calculator. And the results of your calculations can even be transferred to your "underlying" software.

Need to make a phone call? Up pops your personal phone directory. Type in the name you want . . . and Sidekick jumps right to the phone number. Another keystroke, and the phone is automatically dialed for you.†

There's lots more, too. You can move the Sidekick windows anywhere on the screen you like. And you can have as many on screen at a time as you need. There's even an on-line help window for each of Sidekick's features.

We designed it because we needed it. If you've ever been writing a report and needed to do a quick calculation, or jot down a note, then you need Sidekick, too.

†Only with Hayes Smartmodem and compatibles.

GOT *YOUR* SIDEKICK YET?

YOU CAN ORDER YOUR COPY OF SIDEKICK™ TODAY!

For VISA and MasterCard orders call Toll Free **1-800-255-8008** in California **1-800-742-1133**
(lines open 24 hours, 7 days a week) Dealer Distributor Inquiries Welcome 408-438-8400

SIDEKICK™ $49.95 ☐
Non-copy protected Version: $79.95 ☐
(Plus $5.00 shipping and handling.)

Check ☐ Money Order ☐
VISA ☐ MasterCard ☐
Card # _____

Expiration Date _____

*PC jr runs non-copy protected version only

Please be sure your computer is an IBM PC, AT, XT, jr., or true compatible!

NAME _____

ADDRESS _____

CITY/STATE/ZIP _____

TELEPHONE _____

California residents add 6% sales tax. Outside U.S.A. add $15.00. (If outside of U.S.A. payment must be by bank draft payable in the U.S. and in U.S. dollars.) Sorry, no C.O.D. or Purchase Orders.

BORLAND INTERNATIONAL

Borland International
4113 Scotts Valley Drive
Scotts Valley, California 95066
TELEX: 172373

S G7

THE BEST LITTLE WAREHOUSE IN ATLANTA.

When a company is called on to sell as many computer products as we do, it's necessary to stock a select quantity and quality. A comprehensive selection of PC enhancements. A wide choice in Networking and Protocol conversion products for the corporate buyer. Printers for both the business professional and the home and end-user as well as dozens of people dedicated solely to account support. All under one roof.

HOW MICRO MART STACKS UP.

Inside our 40,000 square foot Service and Distribution Center you'll find the world's most popular IBM compatible peripherals and accessories. We're geared to ship hundreds of products daily to customers all over the world. It's easy to see why Micro Mart is the Nation's largest supplier of leading software and hardware.

SIZE, SERVICE & SUPPORT.

Micro Mart delivers and keeps on delivering. That's a promise that keeps us moving. With over a hundred people to serve you, we invite you to call us and check us out. Ask a PC Specialist for advice, or talk with an expert from the Corporate Accounts Division. Order today and we'll ship today, but we won't stop there. Our Technical Support and Customer Service Groups are the finest in the land. They'll not only get you up and running, but see you to the finish line.

CALL FOR EXPERT ADVICE AND YOUR BEST PRICE. FOR THE MICRO MART LOCATION NEAREST YOU CALL 1-404-449-8089 OR 1-800-241-8149.

When you need the right product at the right price, call Micro Mart. We have the necessary inventory and we'll give it to you fast. Show this ad to your purchasing agent.

America's PC Specialist

MICRO MART

Technology Corporate Campus
3159 Campus Drive, Norcross, Georgia 30071

Micro Mart is a registered trademark of Micro Mart, Inc.

ATLANTA, NEW ORLEANS, CHARLOTTE, LOUISVILLE, NASHVILLE, RALEIGH, FT., LAUDERDALE, ORLANDO, TAMPA, MIAMI, TYSON'S CORNER, ROCKVILLE.

CIRCLE 478 ON READER SERVICE CARD

This is THE PASCAL COMPILER You've Been Hearing About

"It's almost certainly better than IBM's Pascal for the PC... Recommended."
Jerry Pournelle
Byte, May 1984

$49.95

"If you don't have CP/M [for your Apple], Turbo Pascal is reason enough to buy it."
Cary Hara
Softalk Apple, May 1984

"If you have the slightest interest in Pascal . . . buy it."
Bruce Webster, *Softalk IBM*, March, 1984

And Now It's Even Better Than You've Heard!

- **Windowing (IBM PC, XT, jr. or true compatibles)**
- **Color, Sound and Graphics Support (IBM PC, XT, jr. or true compatibles)**
- **Optional 8087 Support *(available at an additional charge)***
- **Automatic Overlays**
- **A Full-Screen Editor that's even better than ever**
- **Full Heap Management—via dispose procedure**
- **Full Support of Operating System Facilities**
- **No license fees.** You can sell the programs you write with Turbo Pascal without extra cost.

Yes. We still include Microcalc . . . the sample spreadsheet written with Turbo Pascal. You can study the source code to learn how a spreadsheet is written . . . it's right on the disk.* And, if you're running Turbo Pascal with the 8087 option, you'll never have seen a spreadsheet calculate this fast before!

**Except Commodore 64 CP/M.*

Order Your Copy of TURBO PASCAL® VERSION 2.0 Today

For VISA and MasterCard orders call toll free: 1-800-255-8008
In California: 1-800-742-1133
(lines open 24 hrs, 7 days a week)

Dealer & Distributor Inquiries Welcome 408-438-8400

Choose One (please add $5.00 for shipping and handling for U.S. orders. Shipped UPS)

____ Turbo Pascal 2.0 $49.95 + $5.00
____ Turbo Pascal with 8087 support $89.95 + $5.00
____ Update (1.0 to 2.0) Must be accompanied by the original master $29.95 + $5.00
____ Update (1.0 to 8087) Must be accompanied by the original master $69.95 + $5.00

Check ____ Money Order ____
VISA ____ Master Card ____
Card #: ____
Exp. date: ____

BORLAND INTERNATIONAL
Borland International
4113 Scotts Valley Drive
Scotts Valley, California 95066
TELEX 172373

My system is: 8 bit ____ 16 bit ____
Operating System: CP/M 80 ____
CP/M 86 ____ MS DOS ____ PC DOS ____
Computer: ____
Disk Format: ____
Please be sure model number & format are correct
Name: ____
Address: ____
City/State/Zip: ____
Telephone: ____

California residents add 6% sales tax. Outside U.S.A. add $15.00 (If outside of U.S.A. payment must be by bank draft payable in the U.S. and in U.S. dollars.) Sorry, no C.O.D. or Purchase Orders.

Rapid/Scribe®

Go Quickly.

When you want the work out, but without the workout, then it's time to move up to our speedy multimode matrix printer: the Rapid/Scribe Model DP-6500.

Because Rapid/Scribe ends the frustration you get with a snail-paced printer trying to catch up with your business — your Reports, Letters, Charts and Graphs.

Instead, Rapid/Scribe gives you high-quality correspondence at 137 characters per second, and high-speed reports at over 500 cps. Quickly. Cleanly. And, above all, Reliably.

And business professionals appreciate the standard features such as friction and tractor feeds, sophisticated communications, emulation packages, and alternate character fonts and bar codes.

Couple all this with interfaces to fit about any computer you can name, and you have a solid, high-speed printer that'll let you and your business finish ahead of the pack.

Call us today for complete details. Rapid/Scribe. It'll give you a run for your money.

Outside California: (800) 4-ANADEX
In California: (800) 792-9992

© Copyright 1984 Anadex, Inc.

Anadex ... *When you know printers.*

ANADEX, INC. • 1001 Flynn Road • Camarillo, CA 93010 • Tel: (805) 987-9660 • TWX: 910-494-2761
ANADEX, LTD. • Weaver House, Station Road • Hook, Basingstoke, Hants RG27 9JY, England • Tel: Hook (025672) 3401 • Telex: 858762 ANADEX G

CIRCLE 114 ON READER SERVICE CARD

Copyrighted material

PAINLESS CHOICE.

Albany Medical College chose OfficeWriter™ word processing software for good reason: It was the most effortless PC word processing they tried.

And they aren't alone. Frito-Lay, Wisconsin Power & Light and many other companies across the country have discovered OfficeWriter's Wang-like similarity to dedicated word processing.

Software Digest evaluators gave it a four-star rating — their highest commendation in a comparison of 30 IBM PC word processing software systems appearing in the January 1984 issue of *The Ratings Newsletter*.

Our 30-minute on-screen tutorial puts OfficeWriter at the top of its class for easy start-up.

No other system is easier to use.

Our new OfficeSpeller feature integrates the Proximity/Merriam-Webster electronic dictionary with our newest release for goof-proof text every time.

And a complete set of editing features get high marks for speed, productivity, versatility and performance.

So when you're faced with the problem of which word processing software to choose, take the painless route.

Ask us about our free 30-day trial. (Return the coupon or call **1-800-228-0747**. In Wisconsin call **1-608-274-5047**.) It could mark the end of your word processing software selection headaches once and for all.

IBM is a trademark of International Business Machines Corp. Wang is a trademark of Wang Laboratories Inc.

OfficeWriter™

FREE 30-DAY TRIAL

Please send me more information about a free 30-day trial of OfficeWriter!

Name/Title _____

Company Name _____

Address _____

City _____

State _____ Zip _____

Telephone # _____

Return coupon to:
OFFICE SOLUTIONS INC.
5708 Odana Road, Dept. PCM8214
Madison, WI 53719
Or telephone: 1-800-228-0747
(1-608-274-5047 in Wisconsin)

VISA

CIRCLE 357 ON READER SERVICE CARD

IT RUNS THO PROGRAMS AS

If you have to plan, figure, write, organize, predict or communicate, the NCR PC 4 can help you do it easier and better.

Because the NCR PC is compatible with thousands of off-the-shelf programs available through your local PC dealers.

From the best-selling 1-2-3™ by the Lotus™ people to all sorts of other programs for business, education or just plain fun.

But besides getting more software to choose from you get more computer to work with.

For instance, you can get all the memory you need—all the way up to 640K.

An enhanced keyboard with separate cursor keys and separate numeric key pad that make it easier for you to work with spreadsheets and data base programs.

A special program called a RAM-DISK that acts as a super fast disk drive. It allows you to access information up to 15 times faster than a floppy disk.

And a rugged, compact cabinet that looks great on any desk.

© 1984 NCR Corporation
Lotus and 1-2-3 are trademarks of Lotus Development Corporation. GW-BASIC is a trademark of Microsoft Corporation.

USANDS OF EASY AS 1-2-3.

Plus extras others charge extra for.

Like built-in serial and parallel ports. Disk and video controller boards. Plus the standard operating system, GW™ BASIC and self-teaching programs to get you started.

The NCR PC is also compatible with industry standard hardware. So you can attach all kinds of fun things to it. Like a mouse, a modem, a printer, a hard disk, a graphics board, etc.

In short, the NCR PC is exactly the personal computer you'd expect from a company that's been doing business with business for 100 years.

See your Authorized NCR Personal Computer Dealer. He'll be glad to show you how easily the NCR PC can make things easier for you.

For the name of your nearest dealer call toll-free 1-800-544-3333.*

NCR

A BETTER PERSONAL COMPUTER. IT'S EXACTLY WHAT YOU'D EXPECT FROM NCR.

*In Nebraska call 1-800-343-4300.

CIRCLE 349 ON READER SERVICE CARD

GUARANTEED LOWEST IBM PRICES

What's the catch?

Yes, there is a catch. The guaranteed lowest prices in America on hardware and software for your IBM computer are now available only to members of The Micro Exchange.™ But, the good news is it costs only $25 to join, and you can earn that back *plus much more!*

Computerized Bidding

The Micro Exchange™ is linked by computer with a nationwide network of suppliers who are eager to bid on your order. Through bidding, we're able to purchase products for you at prices which are guaranteed to be the lowest in America. Simply call the toll-free number, available to members only, with the makes and model numbers of the items you wish to purchase. We'll handle the transaction and arrange for the delivery of your merchandise right to your doorstep. All done quickly and efficiently so we keep you as a satisfied member of The Micro Exchange.

OUR INCREDIBLE GUARANTEE

If you find that any item you purchased through The Micro Exchange™ was available at the time of your purchase at a lower nationally advertised price, send us appropriate proof of the lower price, including sales tax, shipping, and other charges, within 21 days of your purchase, and we will refund the purchase price and the merchandise is yours!

Call toll-free today to join...

THE MICRO EXCHANGE™
A Service of MicroVision, Inc.

Also serving the Apple community.

1-800-34M-ICRO

(In Florida Call: 1-800-35M-ICRO)

Ask for operator 76

Earn More Than You Spend

You'll want to tell all your friends and associates about the guaranteed savings at The Micro Exchange.™ And for every new member you refer, we'll thank you by paying you $10 cash! Not only will you easily cover the cost of your membership, but you can even earn hundreds of dollars more through this unlimited offer.

Hardware, Software, You Name It.

We'll furnish you with virtually everything you need for your IBM system, including products from these leading manufacturers:

• Amdek • Ashton-Tate • AST • BPI • CDC • Digital Research • Dow Jones • Epson • Hayes • IBM • IUS • Lotus • MicroPro • Microsoft • Multi-Mate • NEC • Peachtree • Quadram • Tandon • Teac • Tecmar • Visicorp

CIRCLE 171 ON READER SERVICE CARD

Yes, I want to be guaranteed that I'm purchasing my hardware and software at the absolute lowest prices in America.

Charge my ☐ Visa ☐ Master Card ☐ Check or Money Order enclosed

Credit Card No. _____ Expiration Date _____

Name _____

Address _____

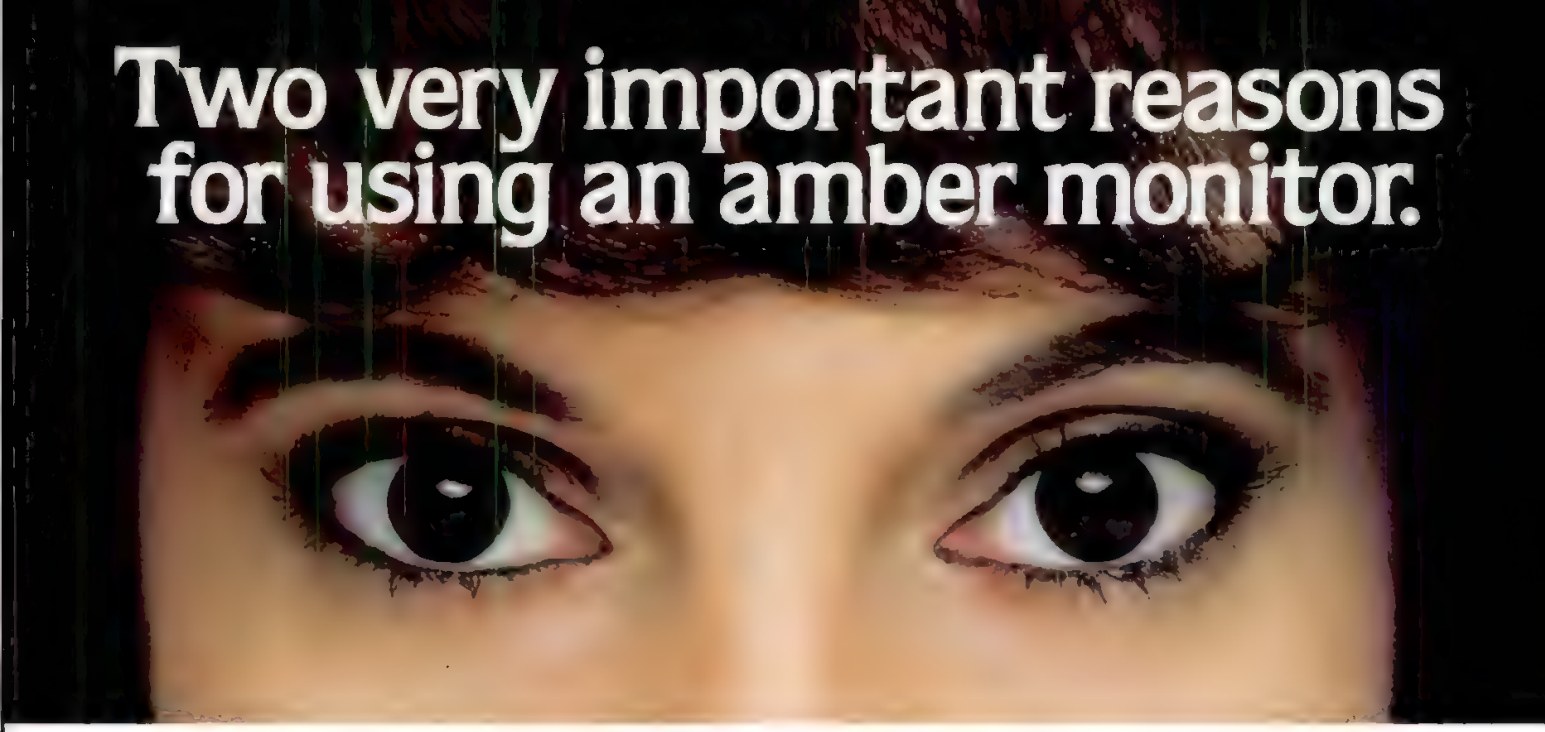
City _____ State _____ Zip _____

Telephone (_____) _____

Signature _____

MicroVision, Inc.
8663 Baypine Road, Dept 76
Jacksonville, Florida 32216
904 737-8400

Two very important reasons for using an amber monitor.



Amberchrome.™ The "easy viewing" amber monitor from Quadram.

Working in front of a PC can be tough on your eyes. But now you can get your work done without giving your eyes a workout. With Amberchrome, the "comfortable" monochrome monitor from Quadram.

Amberchrome combines a soft amber-tone display with sharply focused characters for a no-smearing, no-ghosting, state-of-the-art screen image that's easy on the eyes. Amberchrome lets you spend more time at the computer, reducing irritating eye strain caused by other monitors.

Amberchrome. More than just a sight for sore eyes.
Amberchrome gives you more than just easy viewing. Like a 12" high resolution (720 × 350) screen image that's perfect for any data processing task. Word processing to complex business graphics. Plus Amberchrome features a special dark glass, anti-glare tube; full IBM compatibility; and low power, stay-cool operation.

The Comfortable Choice in personal computer displays.
All this adds up to one lesson that's easy to learn. Visit your local authorized Quadram dealer today and ask to see Amberchrome in action. One look and you'll agree: Amberchrome is the comfortable choice in personal computer displays.

QUADRAM QUALITY™
Look for this seal. It's your assurance that you're buying the best in personal computer enhancements.

QUADRAM™
An Intelligent Systems Company

4355 International Blvd./Norcross, Ga. 30093
(404) 923-6666/TWX 810-766-4915 (QUADRAM NCRS)

INTERNATIONAL OFFICES
Interquadram Ltd 442 Bath Road Slough England SL1 6BE Tel 6286 63865 Tlx 847155 Aurhema G **Interquadram GmbH** Fasanenweg 7 6092 Kelsterbach West Germany Tel 6107 3089 Tlx 417770 Seva G **Interquadram s.a.r.l** 41 Rue Ybry 92522 Neuilly Tel 758 1240 Tlx 630842 iso Bur **Chevco Computing** 6581 Kitimat Road Mississauga Ontario Canada L5N-2X5 Tel 416-821-7800

IBM® PC, XT are registered trademarks of International Business Machines Corporation. ©Copyright 1984 Quadram Corporation. All rights reserved.

CIRCLE 203 ON READER SERVICE CARD

IS PROJECT MANAGEMENT SUCCESS WORTH $795?

You bet it is ... and we guarantee it! PLAN/TRAX 3 is the most complete project management package available and includes complete CPM Network graphics, resource loading and leveling, budget and schedule monitoring and much more. Try PLAN/TRAX 3 at no risk for 30 days. If you are not completely satisfied you will receive a complete refund. To find out more ask your dealer for a demonstration or contact OMICRON, 57 Executive Park, Suite 590, Atlanta, GA 30329 404/325-0124.

- 700 Activities per project using Gantt or CPM scheduling
- Link project files together
- Calendar for controlling week-ends and holidays
- Resource loading and leveling
- Track activity costs and up to 10 labor resources
- Over 20 user selectable reports
- Complete CPM Network graphics
- All reports can be previewed on-screen

PLAN/TRAX 3
By Omicron
A unit of Engineering Science, Inc. and The Ralph M. Parsons Co.

Omicron

CIRCLE (7) ON READER SERVICE CARD

We thought about calling it MacSimplex . . . after all it makes your IBM®PC behave like a Macintosh™ and much more . . .

and with over two years in the making, the Simplex Database Management System has features like 32-megabyte virtual memory and the most powerful networked/relational database in the microcomputer industry. Simplex was designed around how you think and the Macintosh way, so that you can use your favorite mouse to handle those mundane tasks like menu selection and data manipulation. And, if you don't have a mouse, you can use our keyboard mouse simulator, MouSim™.

Pop-up and pull-down menus, dialog and alert boxes are not just added features, they are the heart of the Simplex way. In addition, Simplex gives you both a software and a hardware floating point capability, each with 19-digit accuracy. It permits login, password, privilege, and can be used on a local area network. Simplex has full communications and a remote or local printer spooler. Above all, Simplex is modular and grows with you! Simplex also has a full-featured, English-like language which is simple to use.

You can't buy Simplex™, but it is now available as an integral part of *it's my* ***Business***™ and will be used by *it's my* ***Word***™, *it's my* ***Graphics***™, . . .

Businessmen! *it's my* ***Business*** will revolutionize the way that you handle your business. It saves time, money, and standardizes your system for all who use it. *it's my* ***Business*** comes with applications like accounting, interoffice or intraoffice mail, editing, invoicing, inventory managment, mail list, calendar, scheduler, forms and more. You can modify each of these to create applications specifically designed for you... maybe we should have called it "it's your Business".

Professionals! *it's my* ***Business*** has over 200 pages of examples and demonstrations to show you how to solve your everyday professional problems. And if these examples aren't enough, we give you a complimentary one-year subscription to Questalk™, our hands-on Simplex applications magazine.

System integrators and consultants, beware! If you are not using *it's my* ***Business*** with Simplex to solve your problems, don't be surprised when more novice programmers solve that complex math, industrial engineering, or business problem faster. We think that you can cut your concept-to-development time by an order of magnitude!

it's my ***Business*** (includes *it's my* ***Editor***) - $695.00
it's my ***Business*** Demo Disk - $20.00
it's my ***Editor*** - $100.00.

Quest Research software is available through your local computer store or through mail order from Quest Software Corporation at (205) 539-8086. 303 Williams Avenue, Huntsville, AL 35801.

Value added resellers and dealers please contact Quest Research, Incorporated at (800) 558-8088. 303 Williams Avenue, Huntsville, AL, 35801.

Quest™

Quest Research Inc.

IBM is a registered trademark of International Business Machines. Macintosh is a trademark of Apple Corporation. *it's my* ***Business***, *it's my* ***Word***, *it's my* ***Graphics***, *it's my* ***Editor***, *it's my* ***Home***, *it's my* ***Voice***, *it's my* ***Ear***, *it's my* ***Statistics***, Simplex, MouSim, Questalk, and the Quest logo are trademarks of Quest Research, Incorporated.

CIRCLE 493 ON READER SERVICE CARD

IRMA™ has just made PC-to-mainframe communications a touch faster.

Until now, when you operated the PC in the terminal emulation mode, keys had to be redefined.

For inexperienced users, that could be both awkward and time-consuming.

What's more, it's always required quite a few keystrokes to engage a PC-to-mainframe function such as file transferring.

The result again was an increase in the chance for human error.

As well as an increase in the amount of time and money spent on a job.

Now IRMA's addressed both those problems with a keyboard that costs only $329, suggested retail.

Introducing the IRMAkey/3270. IRMAkey contains all the 3270 keys for terminal emulation. And all the PC keys when you're in the computer processing mode.

Moreover, IRMAkey contains four additional keys that allow the PC user to get IRMA up and running immediately as well as engage any DCA software system the user wants.

All in one simple stroke. IRMAkey/3270. Only from DCA. It's a touch faster than a terminal. Or a PC. Or both.

For more information, send in the coupon to DCA. Faster still, call us at 1-800-241-IRMA. Telex 261375 DCAATL.

Mail to DCA, 303 Technology Park, Norcross, GA 30092. And we'll tell you more about all IRMA products.

Name _____

Firm _____ *Title* _____

Address _____

City _____ *State* _____ *Zip* _____

Phone _____

dca
Digital Communications Associates, Inc

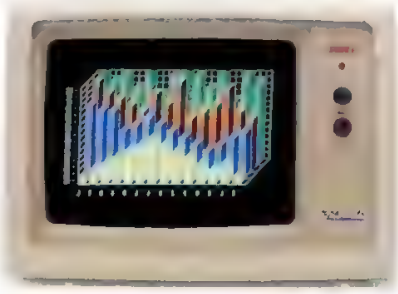
MP-02-09

IRMA and IRMAkey/3270 are trademarks of Digital Communications Associates, Inc. DCA is a registered trademark of Digital Communications Associates, Inc. © 1984, Digital Communications Associates, Inc.

CIRCLE 445 ON READER SERVICE CARD

If you're looking for a quality monitor, look for this symbol.

HX-12. A high resolution monitor at a medium resolution price.



HX-12 is a high resolution RGB color monitor that's colorful enough for all your graphics needs and sharp enough for word processing.

With its own cable that plugs directly into the IBM PC, the HX-12 delivers a rainbow of 16 colors on a non-glare screen. All that includes clean whites without red bleed. In fact, all the colors are clean and crisp thanks to the HX-12's .31mm dot pitch and 690 × 240 (non-interlaced) resolution.

Shop around. Nothing else compares to the HX-12 priced at just **$695.**

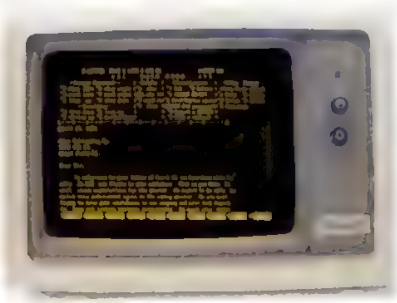
The SR-12 delivers even better resolution color for a better-than-ever price.

At first glance, the SR-12 might appear similar to the HX-12 with a non-glare screen and .31mm dot pitch supporting 690 horizontal resolution. But take a closer look. SR-12's scan frequency is 31.5 KHz, allowing the SR-12 to support 480 vertical resolution in non-interlaced mode. That means a high-quality, flickerless image with text that's up to monochrome standards. What's more, you get all that quality for **$799.**

For full compatibility with all IBM software, get the **Princeton Scan Doubler.** Priced at **$249,** it allows you to run the SR-12 from a standard IBM or IBM equivalent color card in the IBM PC.

You can't beat the SR-12 for resolution or price.

MAX-12. You won't find a better monochrome monitor for a better price.



PGS combines easy-on-the-eyes amber phosphor and exceptional 800 × 350 resolution to give you the MAX-12, the best monochrome monitor for your money.

Check the non-glare screen. Dynamic focusing circuitry keeps the image sharp, not only in the center, but around the edges and in the corners. Then check the price. At **$249** the MAX-12 is less expensive than the leading green-on-black competitor. And there's more. The MAX-12 works with the IBM PC and other IBM compatibles.

For clarity, performance and price, your choice is clear. Make it the new MAX-12.

IBM® PC are registered trademarks of International Business Machines Corporation.

©Copyright 1984 Princeton Graphic Systems. All rights reserved.

PRINCETON™
An Intelligent Systems Company

Princeton Graphic Systems
170 Wall Street, Princeton, N.J. 08540
(609) 683-1660/(800) 221-1490 Ext. 32
Telex: 821402 PGS PRIN

CIRCLE 299 ON READER SERVICE CARD

IBM Personal Computer Trends and Developments

IBM News

FROM THE EDITORS OF PC

NOVEMBER 13, 1984

IBM's New PC Fall Line: Great Graphics, Colors

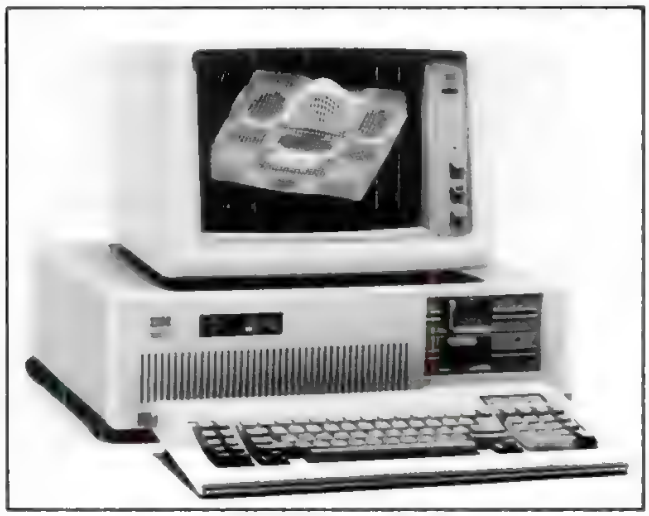
Two new color and graphics systems brighten the PC—but challenge compatibility

BY CRAIG L. STARK

NEW YORK—After treating the PC's limited color graphics capabilities with benign neglect for 3 years, IBM has quickly followed its recent introduction of the PC AT with an announcement of not one, but two, new graphics systems for the entire PC series, excepting the PC*jr*.

Because of scanning-rate differences with the new IBM systems, however, many existing third party vendors' monitors and graphics boards will have to be redesigned or will have to face direct competition from Big Blue.

The first of the two new PC graphics systems includes an RGB TTL Enhanced Color Display monitor with 650-by-350 pixel resolution, a choice of 16 simultaneous colors from a 64-color palette, and reduced (0.31 mm) dot-pitch size. The new monitor uses horizontal scan frequencies of 22 kHz and 15.75 kHz (switched by the polarity of the vertical sync pulse) to provide both the new high-resolution modes and compatibility with the previous 640/320-by-200 color modes. The unit accepts 50 to 60 Hz vertical frame rates for noninterlaced operation. Scheduled for January 1985 delivery, the color monitor is priced at $849.



An Enhanced Graphics Adapter board ($524) that supports either the current PC monochrome or color monitor, as well as the new Enhanced Color Display, was scheduled for October delivery. In addition to 16-color operation when used with the new Enhanced Graphics Display, the new board provides 16-color graphics in both the medium-res (320-by-200) and high-res (640-by-200) graphics modes of the original IBM color monitor. Additionally, it supplies a 640-by-350 graphics mode for the current PC monochrome

(continued)

Jr's Growth Spurts Sales

BY WINN L. ROSCH

CLEVELAND—The Save-the-Junior campaign, as some industry insiders termed IBM's recent enhancements for its smallest computer, is succeeding, at least according to most industry indications.

Before IBM released the PC*jr*'s new keyboard and memory module, entrepreneurs who had bet on a Junior-sized replay of the PC's success story were, at best, disappointed. Hardly 2 months ago, Marty Alpert, president of IBM aftermarket supplier Tecmar, half-seriously joked that he might have to add new warehouse space to the Tecmar factory.

Exactly mirroring PC*jr* sales at the time, Tecmar's enhancements were moving onto warehouse shelves. According to Alpert, dealers were selling more of his PC*jr* accessories than the computers, and Tecmar was selling almost no PC*jr* peripherals. The inventory buildup was most easily measured in millions.

Two weeks after the new PC*jr* keyboard had hit the stores in

(continued)

Better Colors *(continued)*

monitor (8-by-16 pixel box for alphanumerics) and a 9-by-16 pixel box for complete compatibility with the present monochrome character set. The new color board permits user-generated characters that occupy up to a 8-by-32 pixel character box.

Additional memory is required for 16-color, 640-by-350 graphics. The Enhanced Graphics Adapter itself provides 64K. You can raise this to the needed 128K by adding IBM's new $199 Graphics Memory Expansion Card. Such expansion also permits an increase in the size of a user's program-loaded RAM-based character generator from 256 to 512 characters.

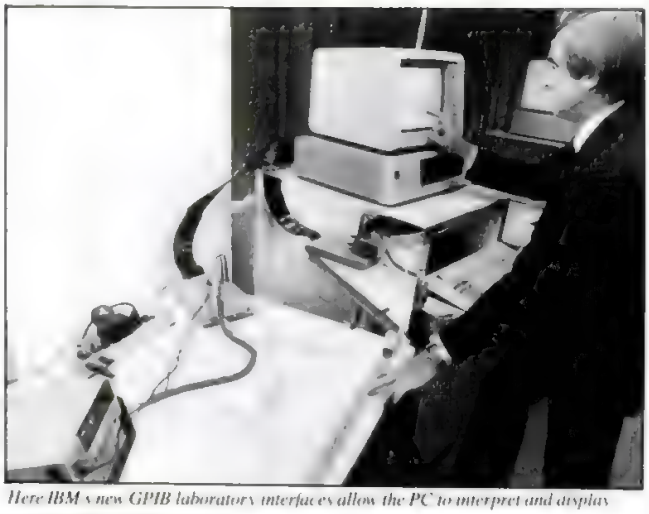
Still further memory expansion is available with the new 256K Memory Expansion Option ($489)—a board that is sized to fit in a short expansion slot in the PC, PC-XT, or Portable PC. The additional memory increases the permissible user character set to 1,024 and provides space for smooth scrolling, panning, and storage of additional graphics pages. The starting address for the 256K Memory Expansion Option is switch-selectable.

Professional Graphics

Even more sophisticated graphics facilities are provided by IBM's other new system, which is scheduled for delivery in October. This includes an analog RGB Professional Graphics Display monitor; a two-slot controller; ISO/proposed ANSI Graphical Kernel System (GKS) and other high-performance graphics software; and additional hardware/software packages designed principally for engineering and scientific applications.

Priced at $1,295, the new Professional Graphics monitor will permit the simultaneous display of up to 256 colors, drawn from a 4,096-color palette. Using a high-resolution, 640-by-480 pixel memory map, the new 14-inch monitor offers 67-pel-per-inch horizontal and vertical definition with a 0.31 mm dot size. The horizontal scanning frequency is 30.48 kHz, and the vertical frame rate is 60 Hz for noninterlaced operation. The video pel rate is 25 MHz.

The required interface for the new monitor is IBM's new $2,995 Professional Graphics Controller, which fits into two adjacent full-sized slots in a PC, PC-XT, or PC AT. (A PC Expansion Unit may also be used, though in this case a second monitor is required for diagnostic tests.)



Here IBM's new GPIB laboratory interfaces allow the PC to interpret and display readings from a strain gauge.

The new color controller provides an emulation mode compatible with current PC graphics as well as its own high-performance capabilities. It contains its own 8MHz 8088 processor, 64K of graphics firmware, and 320K of display storage. Built-in functions include two-and-three-dimensional rotation, translation, and scaling; vector and polygon drawing and polygon filling; use of either absolute or relative coordinates; user-definable colors; and hardware drawing in two or three dimensions.

Users may reprogram the built-in character set and may also vary character size. The system supports image transmission to and reception from all models of the PC series (except the PC*jr*), though very early models of the PC may require an updated ROM BIOS.

GSS Tools

To assist in the development of sophisticated graphics application packages using PC-series microcomputers, IBM has adopted a number of software packages produced by Graphic Software Systems (GSS), of Wilsonville, Oregon. The IBM Graphical Kernel System (or GSS-Toolkit Kernel System) provides a library of two-dimensional graphics primitives (subroutines) designed to implement the ISO and proposed ANSI GKS standard. The graphic routines included are device-independent and support segment rotation, scaling, and transformation. Language bindings are provided to FORTRAN 2.0, Professional FORTRAN, Lattice C, and BASIC compilers.

Graphics for Science

At the heart of the new software offerings is the Graphics Development Toolkit ($350). This includes the GSS Virtual Device Interface (GSS-Drivers) that permits software design to proceed independent of considerations of input and output device characteristics. Specific drivers for a wide range of printers, plotters, terminals, and input devices are already included. The Toolkit also provides subroutines for circles, arcs, pie slices, bars, multiple lines, and markers. Among the other Toolkit facilities are inking, rubberbanding, and a provision for preserving the aspect ratio when using non-1:1 devices. Language support is provided for IBM's FORTRAN 2.0, BASIC, and Pascal 2.0 compilers, and the Macro Assembler. Lattice C support will be the first in a series of customer updates available in a period of 12 months after receipt of the user's registration card.

In moves calculated to increase the usefulness of the PC series in science and engineering, IBM has also announced the availability of new laboratory-oriented interfaces. A $1,275 Data Acquisition and Control Adapter will provide four-channel analog input and two-channel analog output capability with 12-bit resolution, together with 16-channel digital I/O. Programmable timer/counter facilities and diagnostic tests are also provided. Up to four such units, each occupying one full-length slot, may be linked together by the user.

A full *Programming Support* package ($160) for the Data Acquisition and Control Adapter is also available. It contains appropriate high-level language subroutines and sample application programs in BASICA, Compiled BASIC, FORTRAN 2.0, Professional FORTRAN, and Lattice C (Version 2.0). Simplifying the actual equipment connection is a $245 shielded (FCC Class B) Distribution Panel with 88 barrier-type screw terminals and a flat cable with 60-pin connector.

To facilitate connection to other standard laboratory instruments, IBM now offers a General Purpose Interface Bus (GPIB) Adapter for ANSI/IEEE-488 (488A) equipment for $395. Together with its $85 *Programming Support* software, the GPIB allows control and monitoring of up to 14 IEEE devices, with user-selectable direct memory access and interrupt level. The adapter board can fit in a half-length slot; up to four boards may be controlled by the same programming support software.

Finally, of interest to the scientific community is the new IBM Professional FORTRAN, developed by Ryan-McFarland. A full-function ANSI 77 FORTRAN compiler and library that runs under DOS 2.1 or a later version, the new language package provides an interactive symbolic debut facility, supports the 8087 or 80827 math coprocessor, and permits program size in excess of 64K. ■

AT Fazes Symphony and Framework

But Symphony can be run using a "trick"

BY VIRGINIA DUDEK

NEW YORK—The battle for supremacy between the new "super" integrated software packages has been given a new wrinkle with the introduction of the IBM PC-AT. Lotus's *Symphony* and Ashton-Tate's *Framework* have been vying with one another since their respective announcements, but for the short term, a slight edge has to be given to *Symphony* since, in the short run, the AT knocks *Framework* completely out of the ring. *Symphony* manages to hang in there, albeit with some minor adjustments.

At press time, *Framework* does not work on the AT. Officials at Ashton-Tate would not reveal a patch or other method to retrofit the program for IBM's new computer.

However, all new copies of *Framework* will have new code compatible with the AT, as well as the PC, XT, and PC*jr*.

Apparently, two or three lines of the *Framework*'s present code are incompatible with the AT. The modifications being made to *Framework* will solve that problem and enable the program to boot directly off the hard disk. Registered users of *Framework* will be able to exchange their old copies for the new version, probably at the beginning of November, according to company officials.

Symphony Fix

Symphony gains the AT-advantage over *Framework*, but only slightly at the present time. During tests at *PC Magazine*, we found that the AT will not read the program correctly when it is booted in the A: drive or copied onto the hard disk.

However, we found an easy way to get the program running on the AT. To run it off the hard disk, you boot the machine and log onto the hard disk (C:). Then you log onto the appropriate subdirectory, and from there, you access the *Symphony* master disk in drive A:. Probably the easiest way to do this is to call for the directory (DIR A:).

When you call for the directory (or run CHKDSK or a similar DOS command), the AT will note that the disk in drive A: is a 360KB floppy, rather than a high-density disk. After that flag is properly set, the AT will run *Symphony* when you type A:SYMPHONY at the C> prompt.

It may be a little cumbersome, but all of the commands could be written into a batch file to save time. And, until the new copies of *Framework* are available, it is an easy way of using at least one of the powerful integrated packages on IBM's most powerful personal computer. ■

Jr's Sales *(continued)*

force, the whole picture changed. "One order wiped out our entire inventory of PC*jr* enhancements," said Johann George, Tecmar chief technical officer. "Now we're back into production of PC*jr* peripherals." (Although George kept the origin of the massive order a mystery, Sears Business Centers began almost simultaneously to promote the newly improved PC*jr*, favorably priced with the Tecmar add-ons.)

Changing Times

Even a casual passerby could not mistake that something had changed at the Solon, Ohio, Tecmar factory. Six months ago, when PC*jr* peripherals were being readied for production, both the factory and its parking lot were half full. Today, the parking lot overflows onto the adjacent grass, and workmen are adding additional space to the plant.

The PC*jr*'s improving sales haven't been the sole influence on Tecmar's growth but the corporate attitude is now very positive toward the PC*jr*.

Other manufacturers, even those without a current stake in the PC*jr* marketplace, have seen enough change in PC*jr* sales to reconsider their positions. Keith Cook, hardware production manager for Quadram Corporation of Norcross, Georgia, said, "We're developing several new products for the PC*jr*, and we wouldn't do that if we didn't believe that IBM's enhancements had turned it around."

Although Cook refused to specify exactly what new products were in the works, he hinted Quadram was preparing its future PC*jr* peripherals for the Christmas market.

Retail Surge

Retailers as well as manufacturers have taken note of an upsurge of interest–and sales–in the PC*jr*. The majority of retailers contacted said they had already sold more PC*jr*s in the few weeks after the new enhancements became readily available than they did in the whole 7 months of the product's previous incarnation.

Said Walt Klag, assistant manager at a Computer Depot store, "Before we got the enhancement, I sold a total of two PC*jr*s. In the 2 weeks that we've had the enhancements, I've already sold three, and I expect to sell three more tonight to a group of three small businessmen. I tried to sell them PCs, but they were certain they wanted PC*jr*s!"

Although the PC*jr* sales boom is too recent for real numbers measuring it to become available, industry analysts are already recharting their PC*jr* predictions. According to Barbara Isgur, microcomputer industry watcher and vice-president of Paine Webber, IBM probably sold no more than 50,000 PC*jr*s in the 7 months preceding the new keyboard. Her current estimate for 1984 sales is about 150,000. Although an improvement, that rate remains little more than half the estimate of 500,000 units for 1984 made by Future Computing at the end of 1983.

Future Computing itself, has revised its estimates downward. Tricia Parks, vice-president of the Texas firm's Home Computer Group, recently estimated that 200,000 PC*jr*'s would be sold by year-end.

Major Promotions

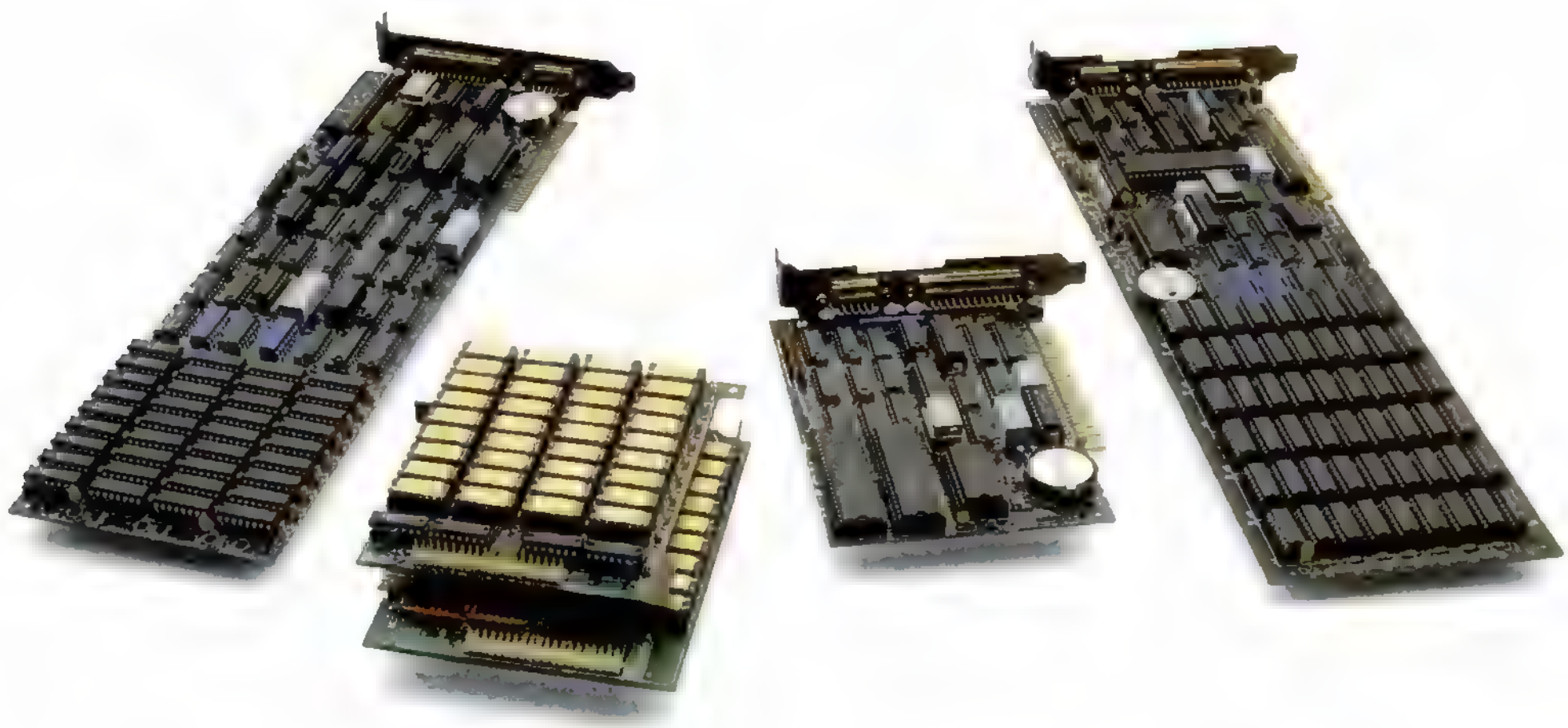
Until the end of October, retail sales representatives will receive a $25 bonus for each PC*jr* they sell. This will be quite a bit easier to accomplish because of several simultaneous promotions IBM is sponsoring.

In its "Back to School" promotion, IBM is giving away DOS 2.1, a BASIC cartridge, and *SAT* or the *Writing Assistant* software when a customer buys a PC*jr* and a color monitor. A similar business promotion will bundle DOS, BASIC, and either the IBM *Writing, Filing*, or *Reporting Assistant* software. Another promotion bundles DOS and either *Multiplan* or *PFS: File* and *Report*. All of these promotions are being supported with direct-mail campaigns to over 10 million people and will last until October 31.

Probably the most eye-catching promotion will take place from October 15 through January 31, 1985. The "Computerrific Sweepstakes" will be conducted with Proctor & Gamble. Consumers will be enticed to enter a sweepstakes with PC*jr*s as the prizes.

Will the Save-the-Junior program work? Will the minor irritation turn into a major money maker for IBM? According to Isgur, the PC*jr* will eventually earn its keep, but its story will be a disappointing sequel to the success of the PC. Although IBM will recoup its investment in the PC*jr* and save its corporate face, she says, the company's littlest computer won't find its way into every living room as IBM seemed to have initially imagined. At best, the PC*jr* will be an accepted partner in small businesses and, depending on the success of IBM's Writing-to-Read program, may play a greater role in education. ■

We have the missing pieces for your IBM PC.

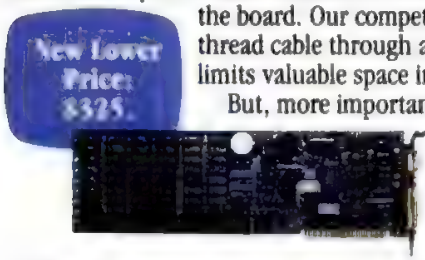


IDEA Multifunction Boards. Across the board, we're the best combination of performance and price.

Performance and price. Until now, when you went shopping for multifunction boards, you had to settle for one or the other. IDEA gives you the best combination of both.

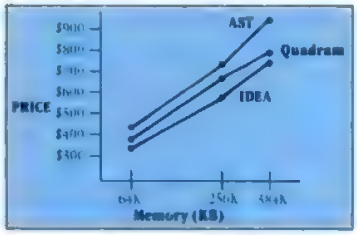
IDEAmax 384

The unique backplane of our IDEAmax 384 multifunction board allows you to cable interfaces directly from the back of the board. Our competitors make you thread cable through adjacent slots. This limits valuable space in your PC.



But, more importantly, why pay $50 to $200 more for our competitors' boards when the IDEAmax is only $325 at the same fine stores? And that price buys you 64K, parallel port, serial port and clock/calendar options. Plus, a game port and a total of 384K memory are also available with IDEAmax.

And, best of all, every IDEAmax 384 is backed by the best quality and support in the business. As your needs expand, the unique IDEA upgrade policy gives you credit for your initial purchase when you're ready to trade up. No one else in the business makes you that offer.



(Based on published manufacturers' retail prices)

All new software that's free

IDEAmax 384—and every IDEA multifunction board—comes with a library of free software programs, including IDEAmenu, RAMfloppy Disk Emulation, Printer Spooler, Printer Selection, Clock Routine, and Diagnostics.

IDEAplus

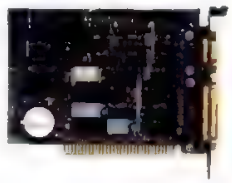
This is our unique host adapter board for the IDEAdisk Plus. We've improved our reliable IDEAplus so that you can boot directly from the hard disk and add 256K, serial, and clock options without using an additional slot.

IDEA Minimax

Designed specifically for the IBM Portable short slots, IDEA Minimax gives you 384K memory in a double decker configuration. Better yet, IDEA Minimax takes only one slot, saving your valuable long slots for other enhancements. Don't buy an XT or Portable without it. From $325 (with 128K RAM).

IDEAmini

Now our versatile I/O short card for the PC and XT fits into the short slots of the IBM Portable. IDEAmini gives you a choice of two serial ports, parallel port, and clock/calendar. And IDEAmini is specially designed to link four PCs in our IDEAshare resource sharing network. Plus, you get our same great software and support. From $195.



Ask for IDEA multifunction boards at Math Box, Computer Depot, Amerisource, Schaak Electronics, and Northeast Computer stores, as well as many other locations. Call **800-257-5027** for the IDEA store nearest you.

IDEA. The best idea *since* the IBM PC is the best idea *for* the IBM PC.

IDEAssociates

The best IDEAs for personal computers.

IDEAssociates, Inc., 35 Dunham Road, Billerica, MA 01821 (617) 275-4430 Telex 94-8245.
IDEAssociates S.A., 5, Route de Chêne, CH1207 Geneva, Switzerland (22)86 11 19 Telex 428 388 KBSCH

See us at
COMDEX™/Fall '84
November 14-18, 1984
Las Vegas Convention Center-West Hall
Las Vegas, Nevada

IBM and the IBM logo are registered trademarks of International Business Machines Corporation. IDEAmax 384, IDEAmenu, IDEAmini, IDEA Minimax, IDEAplus, IDEAdisk, and IDEAdisk Plus are registered trademarks of IDEAssociates, Inc.

CIRCLE 344 ON READER SERVICE CARD

SandStar™ — Modular Technology That Will Never Obsolete Itself!

COMPLETE COMPATIBILITY
All SandStar™ Cards and Modules are designed to be 100% compatible with IBM hardware, operating systems, high level languages and diagnostics. They all come with a one-year repair or replacement warranty and are ready to ship.

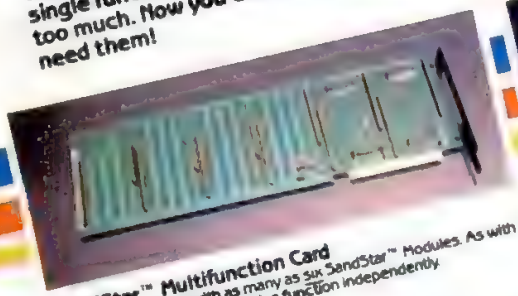
PRICED RIGHT!
All SandStar™ Cards and Modules are competitively priced. In the long run, the SandStar™ Series will save you money.

ASK YOUR DEALER
Look for the SandStar™ Series wherever quality computer products are sold. Watch our ads for new additions to the SandStar™ family.

SandStar™ Cards and Modules are the first IBM*-compatible peripherals engineered to be totally Modular. The ingenious design of the SandStar™ Series has virtually eliminated problems of board obsolescence and running out of expansion slots. Say good-bye to single function or "super" boards which either give you too little or too much. Now you can purchase the functions you need as you need them!

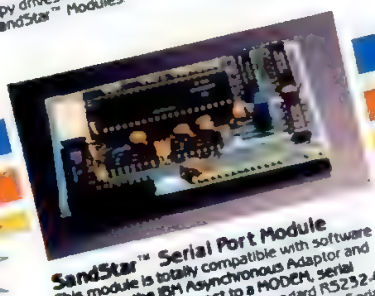
SandStar™ Memory Card and Module
Expand your total system memory from 64k bytes all the way up to 640k bytes using only one card slot. In addition, this card accepts up to three SandStar™ Modules. Includes StarDisk™ Software

SandStar™ 5¼"&8" Floppy Drive Controller Card
Control up to four 5¼" floppy drives or two 8" drives externally. This Card accepts up to three SandStar™ Modules.



SandStar™ Multifunction Card
Configure your card with as many as six SandStar™ Modules. As with all SandStar™ Cards, all modules function independently.

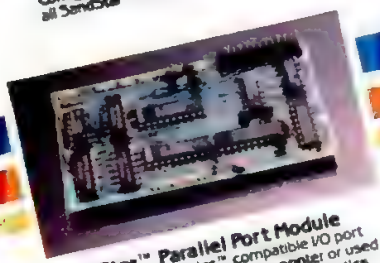
SandStar™ Hard Disk Controller Module
This module provides an interface between you IBM PC and the industry standard ST-506 type hard disk drives. Includes ECC (error checking and correcting).



SandStar™ Serial Port Module
This module is totally compatible with software written for the IBM Asynchronous Adaptor and may be used to connect to a MODEM, serial printer or any device using a standard RS232-C interface. The port may be configured as Serial Port #1 or #2.

NEW!

SandStar™ SASI Host Adaptor Module
This module interfaces your PC to any SASI (or SCSI) compatible device such as the Xebec Hard Disk Controller.

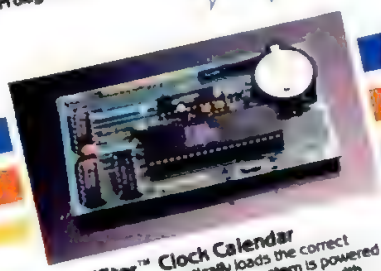


SandStar™ Parallel Port Module
This port is a Centronics™ compatible I/O port which may be used to connect a printer or used as a general purpose I/O port. IBM diagnostics will run on this module.

SandStar™ Game Adaptor Module
With this module you can attach up to four paddles or two joysticks. It may also be used with four digital inputs and four analog inputs for general purpose graphic applications. It uses the same type 15 pin "D" subminiature I/O connector as the IBM Game Control Adaptor.

NEW!

SandStar™ Prototype Module
This module can be used to create prototype designs which can be installed in the IBM PC.



SandStar™ Clock Calendar
This module automatically loads the correct time and date each time the system is powered up. The clock and calendar are equipped with battery back-up and run even when the power is turned off. Software included.

MAYNARD ELECTRONICS
400 E. Semoran Blvd. • Suite 207
Casselberry, Florida 32707 • 305/331-6402

We make modern times better.

*IBM is a trademark of the International Business Machines Corporation.

Antiques Courtesy of Lloyd Boughter, Orlando, Fla. Dealer.

CIRCLE 437 ON READER SERVICE CARD

PRODUCT REVIEW

IBM Utilities Give DOS a Personal Touch

BY TOM BADGETT

The utility programs reviewed here are part of IBM's initial release of 36 packages of Personally Developed Software—programs created by IBM employees and their families (see "IBM Floods Market with Low-Cost Software," *PC*, Volume 3 Number 21, page 33). IBM sells this software in no-frills packages without printed manuals; all documentation is provided in files on the program disks.

All five packages are available in a set, called the *Utilities Package*, for $56.95, which is far less than the combined price of $94.75.

Personally Developed Software is available through some IBM Product Centers and from authorized IBM dealers. These programs and a free catalog describing all 36 packages can be ordered by writing to IBM, Personally Developed Software, P.O. Box 3280, Wallingford, CT 06494. For phone orders, call (800) 426-7279.

Utilities I
by Gary Forghetti and Jack Gersbach
List Price: $19.95
Requires: DOS 1.1 or later

This package contains three useful utilities: a FILE COMPRESS and EXPAND DUO, plus a *DOS Command Retriever*.

The COMPRESS utility changes specified disk files so they take up less storage space; EXPAND puts these files back together again. You can reduce file size up to 43 percent with this utility, depending on the file type. Of course, you can't use your files while they are compressed, so the EXPAND utility is necessary to restore the original file format. It takes about a minute to compress a 64K file and a little less than that to expand it.

You would probably use these programs only to store large data or text files for backup or archive purposes. This use, however, could reduce the number of floppies or hard-disk space you need for your files.

The RETRIEVE program is generally more useful. It lets you make up short abbreviations for DOS commands, store these commands in an "alias" file, and use your custom command names with DOS instead of the originals. The program also remembers keyboard or program-generated DOS commands (up to 512 characters) and lets you access them with the cursor control keys. Finally, RETRIEVE redefines some keys to allow DOS command editing, which is much easier to learn and more versatile than the function key commands built into DOS.

For heavy users of DOS, RETRIEVE alone makes the cost of IBM's *Utilities I* disk worthwhile. If you need file compacting as well, so much the better.

Utilities II
by James Feeney, David Bishop, and Robert A. Flavin
List Price: $19.95
Requires: 128K DOS 2.x

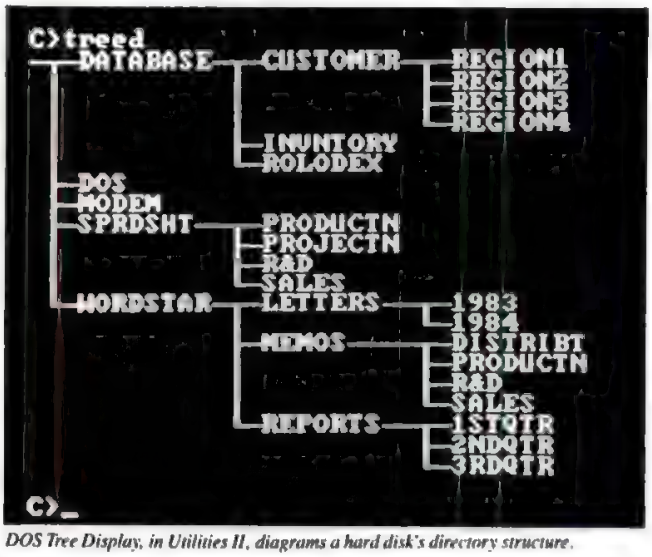
The IBM *Utilities II* disk contains four DOS-level utilities: BACKUP, UNMARK, *File Locator*, and *DOS Tree Display*. While hard-disk users may benefit most from them, all of these programs work with single or dual floppy systems.

DOS 3.0 includes a BACKUP utility that will work with floppies, but it stores the backed-up files in a special format, so you can't use their data until you run RESTORE. The BACKUP program on the *Utilities II* disk is less elaborate: It copies modified files to the specified disk or subdirectory. The resulting copies are in standard DOS format and can be used like any other files.

The UNMARK utility, a companion to BACKUP, lets you manually set a disk's archive bits; a unique memory location for each file tells backup routines if any file has been changed since the last copy was made. With UNMARK, you can turn all archive bits on or off. Unfortunately, you can't specify individual files for change. Even so, UNMARK gives you some degree of control over which files are backed up at the end of a session. This utility works with the DOS 3.0 BACKUP or the version provided in *Utilities II*.

File Locator helps you find a file that is somewhere in one of your subdirectories. Run the LOCATE routine and tell it which file you're looking for; you'll get a display showing file size, date, time, and location. You can look for a range of files by using wild-card symbols (* and ?). LOCATE also helps find a filename appearing in multiple directories.

For subdirectory users, the *Tree Display* program is a must. Unlike the DOS TREE command that prints a list of directory paths and the subdirectories in each path, *Tree Display* shows graphically all relationships among disk directories. The result is similar to an organization chart, with vertical and horizontal lines connecting the different directories. You can tell at a glance what directories are where and how they relate to elements higher in the tree. Unfortunately, the chart only appears on the computer screen. It can be printed only by using a graphics screen dump utility.



DOS Tree Display, in Utilities II, diagrams a hard disk's directory structure.

DOS File Tracker
by Barry N. Shiffrin
List Price: $19.95
Requires: 128K DOS 1.1 or later, two disk drives

Ever notice how your computer's disks seem to multiply faster than coat hangers in a closet. If you count your disks every few months, you'll find a geometric progression that expands faster than your storage space. Soon it's impossible to remember which disk holds what, and you'll probably muse that a 2-kilobuck hard disk isn't too expensive after all.

IBM's *DOS File Tracker* program may stave off that major

(continued)

GenTech

COMPUTERS

COLUMBIA
MPC 4210 (128K, 2 Drives) . . . . . $Call
MPC 4610 (10 MB Hard Disk) . . . . . $Call
VP 2110 (Portable) . . . . . $Call
MPC 4220 (256K, 2 Drives) . . . . . $Call
MPC 4620 (256K, 10 MB Hard Disk) . . . . $Call
VP 2220 (Portable w/256K) $2195

CORONA
PC-22 (256K, 2 Drives) . . . . . $Call
Portable PC-22 (256K, MS-DOS 2.0) . . . . $Call
Portable PC-XT (256K, 10 MB Disk) . . . . . $Call

FUJITSU MICRO 16s (8086/Z80A) $1995

NEC
PC-8201A (w/ 16K RAM) $479
PC-8801A (Z80A, 64K, 2 Drives, 12" Monitor, WordStar, MailMerge, Multiplan, NBASIC) $1199
PC-8801A W/8086, DOS $1499
APC-H02 (8088, 128K, 2 8" Drives) $2849

SANYO
MBC 550-2 (8088, 128K, 1 DSDD Drive (320K), WordStar, CalcStar, EasyWriter) . . . . . $Call
MBC 555-2 (550-2 Plus 1 Add Drive, Mailmerge, Spellstar & Infostar) . . . . . $Call
SEEQUA Chameleon/Plus (8088, Z80) . . . $Call

SWP Micro Computer Products
Co-Power-88 Board (8088 w/ 256K, 1 MB)
For **KAYPRO 2, 4, 10 & MORROW** . . . . . $Call
★★ Lotus Patch Now Available ★★
TAVA IBM Look-Alike (128K, 2 Drives) . . . $Call

TELEVIDEO
1605 (8088, 128K, 2 Drives, DOS 2.0) . . . . $Call
TPC-II (Portable Version of Above) . . . . . $Call
Personal Mini (Multi-User System) . . . . . $Call

FOR IBM PC & COMPAQ

AST RESEARCH INC.
MEGA PLUS II (64K, Ser & Clk) $285
SIX PACK PLUS (64K, Ser/Par, Clk) $285
COMBO PLUS (64K, Ser/Par, Clk) $285
I/O PLUS II (Serial Port, Clock/Cal) $129
★★ OPTIONS ★★
64K Installed $55
Serial/Parallel/Game Port $45
MONO GRAPH PLUS Card . . . . . $Call

QUADRAM
EXPANDED QUADBOARD (S, P, Clock, Game)
64K . . . . . $279 384K $529
QUAD 512+ (Serial Port, Maximum 512K)
64K . . . . . $239 256K $389
QUADCOLOR I (Video Board) $199
QUADLINK (8502 w/ 64K) $479

AMDEK MAI Board (128K, 640 x 400) . . . $389
CCS SuperVision (132 Column) $489
HERCULES Graphics Board (720 x 384) . . $339
Color Card (RGB, Composite, Parallel) . . . $169
INTEL 8087 Math Co-Processor $249
KEYTRONIC Deluxe IBM Keyboard (5151) . . $209
MA SYSTEMS PC Peacock (RGB & Composite, Parallel Port) $230
MICROLOG Baby Blue II (Z80B, 64K, Parallel & Serial Ports, Clock/Calendar) $539
ORCHID PC Turbo . . . . . $Call
PANASONIC JA 551-2 (DSDD Thinline Drive) $149
PARADISE SYSTEMS Multi-Display Card . . $409
Modular Graphics Card $305
PLANTRONICS ColorPlus $419
STB SYSTEMS Graphix Plus II $269
Rio Plus II . . . . . $Call
TANDON TM 100-2 (DSDD Disk Drive) . . . $179
TEAC FD-55B (DSDD Thinline Drive) $159
TECMAR Graphics Master (640 x 400 RGB) $519
The Captain (w/ OK) $259
1st Mate (w/ OK) $229

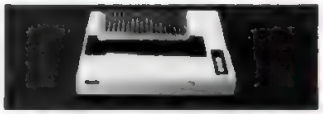
HARD DISK

CASITO 10 MB Internal for IBM $875
MICRO SCIENCE 10 MB Half Height $879
CORVUS
Omnidrive (11 MB) $2079
Transporter . . $399 Printer Server . $809
Network Mirror $809 The Bank . . . $1779

DAVONG
Universal External: 10/21 MB . . . . $1925/$2645
Internal for IBM: 10/21 MB . . . . . $1695/$2495
IOMEGA Bernoulli Box
Dual 10 MB Remov. Cartridge Drives . . . . $Call
PEGASUS-GREAT LAKES
10 MB Internal For IBM $1079
23 MB External (w/ Controller) $1799
DCS
10/20 MB (w/ 5 MB Back-Up) . . . $2995/$3495
TALLGRASS
12 MB External w/ Tape Back-Up $2799
20 MB External w/ Tape Back-Up $3179
TECMAR
Remov. Cartridge Winchester in PC (5 MB) $1589
10 MB w/ 5 MB Cartridge in Chassis . . . $3149
XCOMP 16 MB External (For IBM, Apple, Kaypro & Morrow Designs) $1749
CALL FOR PRICES ON DATAMAC, ALLOY, SYSGEN

DOT MATRIX PRINTERS

BROTHER/DYNAX DM-40 . . . . . $Call
C-ITOH Prowriter I 8510 AP $349
DATA PRODUCTS 8000 Paper Tiger Series . $Call
DATASOUTH DS-180 . . . . . $1149



EPSON JX-80: Color Printer . . . . . $Call
LQ-1500 . . . . $1149 RX-100 . . . . . $Call
RX-80 . . . . . $Call RX-80 F/T . . . . $Call
FX-80 . . . . . $Call FX-100 . . . . . $Call
★★ NLQ Option Board for FX/JX Available ★★

FLORIDA DATA (600 CPS, 4 Fonts) $3095
MANNESMANN TALLY
MT 160L . . . . $599 MT 180L $789
Spirit-80 . . . . $289 MT 1602 . . . . $Call
MPI Sprinter . . . . . $Call
NEC
P2 Pinwriter (180 CPS, 10" Carriage) $649
P3 Pinwriter (180 CPS, 15" Carriage) $869
OKIDATA
ML 92 . . . . . $Call ML 93 . . . . . $Call
ML 84(P) . . . . $Call Pacemark . . . . $Call
PANASONIC KX-P1090/1091 . . . . . $279/$329
SMITH CORONA D-200
(120 CPS, NLQ 17 x 16) $469
STAR MICRONICS
Gemini 10X . . . $285 Gemini 15X . . . $389
Delta 10 . . . . $409 Delta 15 . . . . $549
Radix 10 . . . . $589 Radix 15 . . . . $689
TEXAS INSTRUMENTS
850 RO . . . . . $489 855 RO $759
TOSHIBA
P1340 . . . . . $779 P1351 . . . . . $1399

LETTER QUALITY PRINTERS

ABATI LQ-20 (18 CPS, 15" Carriage) $385
BROTHER/DYNAX
HR-15 (13 CPS, Diablo Compat.) $389
HR-25/HR-35 . . . . . $649/$889
DIABLO
620 API . . . . $809 630 ECS/IBM . $2049
JUKI 6100 (17 CPS, Diablo Compat.) . . . . $Call
NEC
2030 . . . . . $685 2050 . . . . . $815
3530 . . . . . $1275 7710 . . . . . $1725
★★ CALL FOR 8800 SERIES PRICING ★★
OLYMPIA Compact RO/2 . . . . . $459/$429
ESW 3000 (50 CPS, 15" Carriage) . . . $1399
QUADRAM Quadjet (Ink Jet Printer) $759
QUME Sprint 1140/1155/1190 . $1299/$1479/$Call
SILVER-REED
EXP 500 (Parallel or Serial) $369
EXP 550 (P or S, 15" Carriage) $449
STAR MICRONICS Power Type (18 CPS) . . $339
TRANSTAR T120/T130 . . . . . $409/$569

PLOTTERS

AMDEK DXY-100/Amplot II . . . . . $609/$879
ENTER COMPUTERS
Sweet-P . . . . . $Call Six Shooter . . $859
HOUSTON INSTRUMENTS
DMP-40-2 . . . $779 DMP-29 . . . . $1849
DMP-41/42 . . $2399 DMP-51/52 . . $3695
DT-11 Digitizer (1-Button Cursor) $719
DT-114 Digitizer (4-Button Cursor) $779
PANASONIC VP-6801A $1449
ROLAND DXY-101/DXY-800 . . . . . $539/$699
STROBE Model 200/Model 260 . . . . $519/$729

MONITORS

AMDEK
Video 300/300A/310A . . . . . $135/$145/$159
Color I+ . . . . $269 Color II+ $419
Color 300/500/600/700/710 . . . . . $Call
MONITECH 12" Green/Amber $89
PRINCETON GRAPHICS HX-12 . . . . . $479
SR-12 (690 x 480) $819
Max-12 (12" Amber, TTL) $185
QUADRAM Quadchrome $489
Quadchrome II $459
ROLAND
MB-121G . . . $135 MB-121A . . . $145
MB-122G . . . $155 MB-122A . . . $165
CB-141 . . . . $279 CC-141 . . . . $559
SAKATA
SG-1000 . . . . $109 SC-100 . . . . $269
SA-1000 . . . $119 SC-300 . . . . $699
TAXAN
KG-12N . . . . $109 KG-12N/UY . . . $119
210 (380 x 262) $259 420 (640 x 262) $439
ZENITH
ZVM-123A . . . . $99 ZVM-122A . . . $105
ZVM-135 (13", RGB/Composite, 640 x 240) $459

TERMINALS

ESPRIT
Esprit I . . . . . $Call Esprit II $499
Esprit III . . . . . $Call ESP-6310 . . . $589
QUME 102/102A . . . . . $469/$489
103/108 (Green) . . . . . $849/$519
TELEVIDEO 914/924 . . . . . $519/$675
950/970 . . . . . $Call
Personal Terminal $419
w/ 300 Baud Modem $526

VISUAL 50/55 . . . . . $559/$889
102/300 . . . . . $839/$769
WYSE
WY-50 . . . . . $519 WY-75 . . . . . $619
WY-100 . . . . . $659 WY-300 . . . . $819
ZENITH
Z-29 . . . . . $649 Z-49 . . . . . $Call
ZTX-10 . . . . . $329 ZTX-11 . . . . . $389

COMMUNICATIONS FOR IBM

ANCHOR
Mark VI . . . . $179 Mark XII $259
DCA Irma/Irmaline . . . . . $Call
HAYES
Smartmodem 300/1200 . . . . . $219/$509
Smartmodem 1200B (IBM) $439
HOVATION
Smart Cat Plus 300/1200 w/ Mite $329
PRENTICE POPCOM C100/X100 . . . . $959/$379
QUADRAM Quadmodem . . . . . $Call
TRANSEND PC Modem Card 1200 . . . . . $419
VEN-TEL 1200 Plus . . . . . $Call

SOFTWARE

ASHTON-TATE dBase III/Framework . . . . $Call
HAYES Pjease $239
LIVING VIDEOTEXT ThinkTank $135
LOTUS 1-2-3/Symphony . . . . . $329/$Call
MDBS Knowledge Manager $349
MICROPRO WordStar Pro Pack (IBM) . . . $Call
MICRORIM R Base 4000 . . . . . $309
MICROSOFT Multiplan $129
SAMNA Word III . . . . . $Call
SATELLITE SOFTWARE WordPerfect $259
SOFTWARE PUBLISHING PFS Write $105
SOFTWORD SYSTEMS Multimate $319
WARNER SOFTWARE Desk Organizer $205

MISCELLANEOUS

SINGLE-SIDED DISKETTES
3M . . . . . $23 Dysan $24
Maxell . . . . . $23 Verbatim $23
DOUBLE-SIDED DISKETTES
3M . . . . . $30 Dysan $32
Maxell . . . . . $32 Verbatim $31

SPECIAL
RANA 1000..$255

PRINT BUFFERS
QUADRAM Microfazer
Parallel/Parallel
16K . . $139 64K . $165 128K . $239
Serial/Serial, Serial/Parl, Parl/Serial
8K . $145 16K . . $155 64K . $209
INTERACTIVE STRUCT. ShuffleBuffer 32K . . $219
PRACTICAL PERIPHERALS Microbuffer 32K. $209

SURGE PROTECTORS
NETWORX Wire Tree/Wire Tree Plus . $59/$75
ULTIMA SF-600 . . . . . $39

EMERGENCY POWER SYSTEMS
TrippLite BC200-10 (battery incl.) $270
TrippLite BC425-FC (425 Watts) $429

THE GENTECH DIFFERENCE

- Friendly, well-informed staff intent on catering to your needs
- Factory sealed merchandise
- 90 day manufacturer's warranty on all products
- Testing available on request
- Skilled service technicians for state-of-the-art repair

We at GenTech offer the lowest prices possible without sacrificing the personalized care & attention you need for full satisfaction. It's that simple.

CUSTOMER SERVICE

401-781-0020

ORDERS ONLY

800-843-4302

150 Broadway, Suite 2212, N.Y., NY 10038

Money Order, Cashier's Ck, Personal Ck (2 Weeks To Clear).
All Prices Reflect Cash Discount. 2% COD Charge.
APO Orders Add 6%. Add 3% For Net Terms.
All Returned Non-Defective Merchandise Are Subject To 20% Restocking Charge.
GenTech Reserves the Right to Change Advertised Prices.

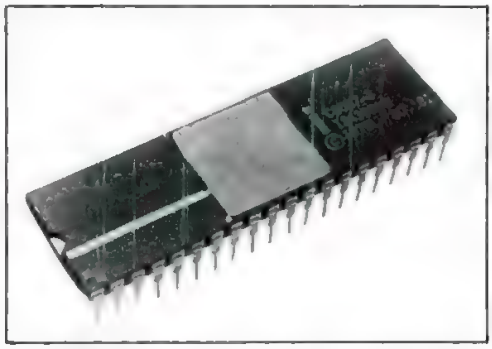
CIRCLE 132 ON READER SERVICE CARD

THE 8087 IS IN STOCK!

MicroWay* is the world's leading retailer of 8087s. We also have the most accurate statistics on chip reliability. They are: .01% infant mortality, .00% adult mortality and .02% 8088 incompatibility. As for ease of installation, we have never had a customer return a chip because of bent pins. We are so confident that you will be able to successfully install and use the chip that we offer a 180-day warranty with every chip we sell. That's 90 days more than anyone else!

To support the 8087 we stock the largest selection of of 8087 software anywhere. This includes: three FORTRANs, three PASCALs, APL, Intel's ASM86, PL/M-86, several Cs, 87BASIC, 87MACRO and MATRIXPAK. For real time or multi-user applications we offer RTOS™ – our implementation of Intel's iRMX executive. Our new products include a professional debugger with 8087 support, an interface library which enables MS Fortran users to call the IBM Basic Compiler Library, and a translator that converts object modules into readable assembly language files. If you have a question about which computer, language, compiler, operating system or application package is best suited to your problem, we can answer it. Just call:

Information and Orders—
617-746-7341
University, Corporate and Government Buyers—
617-746-7364



Micro Way™ 8087 Support

MWS-286™ Configured to your specifications, our computer runs RTOS-286 or XENIX. Includes one Intel compiler, seven slot multibus chassis, hard disk, streaming tape backup and Intel Service Contract. Six to twenty times faster than your PC ..... **CALL**

REAL TIME MULTI-TASKING/ MULTI-USER EXECUTIVE – RTOS RTOS is a MicroWay configured version of iRMX-86. Includes ASM-86, LINK-86, LOC-86, LIB-86, and the ROM Hex Loader..... **$600**

87FORTRAN/RTOS™ - our adaptation of the Intel Fortran-86 Compiler generates in line 8087 code using all 8087 data types including 80-bit reals and 64-bit integers. The compiler uses the Intel large memory model, allowing code/data structures of a full megabyte, and supports overlays. Includes RTOS and support for one year **$1350**

87PASCAL/RTOS™ is Intel's ISO-Standard Pascal with 8087-8088 exceptions. These make it possible to use all the 8087 data types directly, while generating modules in one of the three Intel Memory Models. Includes RTOS and support for one year..... **$1350**

RTOS DEVELOPMENT PACKAGE includes 87FORTRAN, 87PASCAL, PL/M-86, Utilities, TX Screen Editor and RTOS.... **$2500**

OBJ→ASM™ - a multipass object module translator and disassembler. Produces assembly language listings which include public symbols, external symbols, and labels commented with cross references. Ideal for understanding and patching object modules and libraries for which source is not available **$200**

FFT87 an FFT package for the 8087. Performs Forward and Inverse Transforms on complex data. Callable from SSS or MS Fortran..... **$150**

MATRIXPAK™ manages a **MEGABYTE!** Written in assembly language, our runtime package accurately manipulates large matrices at very fast speeds. Includes matrix inversion and the solution of simultaneous linear equations. Callable from MS Fortran 3.2, 87MACRO, 87BASIC, and RTOS..... each **$150**

87BASIC™ includes patches to the IBM Basic Compiler and both runtime libraries for USER TRANSPARENT and COMPLETE 8087 support. Provides super fast performance for all numeric operations including trigonometrics, transcendentals, addition, subtraction, multiplication, and division **$150**

87BASIC/INLINE™ generates inline 8087 code! Converts the IBM Basic Compiler output into an assembly language source listing which allows the user to make additional refinements to his program. Real expression evaluations run seven times faster than in 87BASIC..... **$200**

87MACRO™ - our complete 8087 software development package. It contains a "Preprocessor," source code for a set of 8087 macros, and an object library of numeric functions including transcendentals, trigonometrics, hyperbolics, encoding, decoding and conversions **$150**

87DEBUG™ - a professional debugger with 8087 support, a sophisticated screen-oriented macro command processor, and trace features which include the ability to skip tracing through branches to calls and software and hardware interrupts. Breakpoints can be set in code or on guarded addresses in RAM..... **$150**

FOR→BAS™ - a library of interface routines which allow MS Fortran programs to call the IBM Basic Compiler library and access features such as the RANDOM NUMBER GENERATOR, SOUND, PLAY, DRAW and SCREEN commands..... **$150**

8087-3 CHIP..... $175
including DIAGNOSTICS and 180-day warranty
64K RAM Set..... $45
256K RAM Set.... $325
80287 CHIP..... $350
8087 8mhz..... CALL

MICROSOFT FORTRAN 3.2.... $239
MICROSOFT PASCAL 3.2..... $209
These IEEE compatible compilers support double precision and the 8087.

DIGITAL RESEARCH FORTRAN..... $279

MICROSOFT C COMPILER includes Lattice C and the MS Librarian..... **$329**

LATTICE C with 8087 support **$329**

FLOAT87 for MS C	125
SuperSoft Fortran 66	329
Computer Innovations C86	345
STSC APL★PLUS/PC	500
TURBO PASCAL or SIDEKICK	45
TOOLBOX	45
TURBO PASCAL with 8087 Support	85
HALO GRAPHICS	CALL
GRAPHMATIC	125
ENERGRAPHICS	295
Professional BASIC	295
COSMOS REVELATION	850
SCO XENIX ™ MICROSOFT	595
MAYNARD WS1 HARD DISK	975
MAYNARD WS2 HARD DISK	1139
smARTWORK by WINTEK	895
SPSS/PC	695

NO CHARGE FOR CREDIT CARDS
ALL ITEMS IN STOCK
CALL FOR COMPLETE CATALOG

Micro Way P.O. Box 79 Kingston, Mass. 02364 USA (617) 746-7341

You Can Talk To Us!

*Formerly MicroWare, Inc. – not affiliated or connected with MicroWare Systems Corporation of Des Moines, Iowa.

CIRCLE 331 ON READER SERVICE CARD

IBM Utilities *(continued)*

purchase just a little longer. This program reads directories from multiple disks and stores this information in a separate data file. You can add comments to each filename and sort the names by disk ID, date, or filename extension. With it, you can keep a current catalog, which helps you to find the files you need and to reduce file duplication.

The *DOS File Tracker* is well-documented and uses menus, on-screen prompts, and single-key entry for ease of operation. Each directory is read into memory as you use it, so the more memory you have available, the larger each directory can be.

On a 128K RAM machine you can have about 386 directory entries. You may want to divide the list up by type, such as word-processing files in one directory and entertainment programs in another.

While you may find the initial setup somewhat cumbersome, once you've created the master directories, it will be relatively easy to maintain them whenever you change the information on any disks.

File Facility
by Ronald L. Saunders and Michael R. Turner
List Price: $19.95
Requires: 128K DOS 2.x

For years, third-party vendors have designed add-on hardware and software to fix a flaw or enhance a feature in original computer products. Now, IBM is doing this for its own software. The recently-released *File Facility* is a DOS overlay that does away with a troublesome PATH file-handling restriction found in DOS 2.0 and later versions.

The PATH facility lets you tell DOS where to look for the files you want. With PATH, you can be in a heavily nested subdirectory on the hard disk and call for a file in a drive A: subdirectory, without specifying the drive and path in the file name.

The problem, however, is that PATH only recognizes files that can be executed from DOS: those with .COM, .EXE, and .BAT extensions. Therefore, an applications program—word processor, spreadsheet, mail list, or accounting package—must be in the same directory as its data or overlay files. For example, if you're using one word-processing subdirectory for personal correspondence, another for business, and a third for a mailing list, you'll need three copies of the word-processing software and its support files.

The sorting options are presented in this menu

The new *File Facility* helps PATH find any type of file. With this utility, you can use subdirectories that store different kinds of data, but you will need only one copy of the application program.

File Facility also helps adjust older programs to the newer computers and operating systems. Some programs that were written before DOS 2.0 don't support hard disks and subdirectories very well. Some even lock you into a specific drive configuration by preceding each program name with a drive specification. *File Facility* will first try to find the file on the specified drive; if it isn't there—say, because you've moved all your software from a dual floppy system to a hard disk—the utility will search all drives and directories until the file is found.

Like other programs in IBM's Personally Developed Software series, *File Facility* offers only on-disk documentation, but this is quite detailed. It includes examples and applications notes to help you get the most out of this utility and the built-in DOS commands.

The StarProof Bridge
by Arnold Schaeffer
List Price: $14.95
Requires: 128K RAM, DOS 2.x, *WordStar, Word Proof*

The Starproof Bridge is intended for a very specific audience: *WordStar* users who want to run texts through IBM's *Word Proof* spelling checker. The *Bridge* provides an interface between *WordStar* files and *Word Proof*.

The program includes a routine (CONV) that converts *WordStar*'s idiosyncratic files into straight ASCII format. ASCII conversion is done automatically as part of the *Word Proof* interface, but afterward, the file is put back into its original *WordStar* format when the checking is done. If you need a *WordStar* file in an ASCII format, CONV does the job and retains any special printer control characters that were part of the original file. This causes the file to appear curiously on the screen—control characters are displayed as smiling faces and other special characters—and your printer may be upset when you list the file.

One important warning: When using CONV, if a disk error occurs, such as a disk-full condition, the program will appear to end normally, but actually the converted file is truncated or nonexistent. You should always check the results of the CONV process; never assume it was properly conducted. There are no error messages or progress reports built into *The StarProof Bridge*.

Although this utility is menu driven, you must remember on your own to save the file after it's checked with *Word Proof*. The utility moves the file into memory to work on it, so no changes are saved to disk until you ask to do that through the menu.

WordStar users who have longed to make use of IBM's extensive spelling dictionary will find *The StarProof Bridge* a useful addition to their program libraries. ■

Select Adds Query, Outline Systems

NEW YORK—Select Information Systems is expanding the capabilities of its traditional word processing software with unique new features.

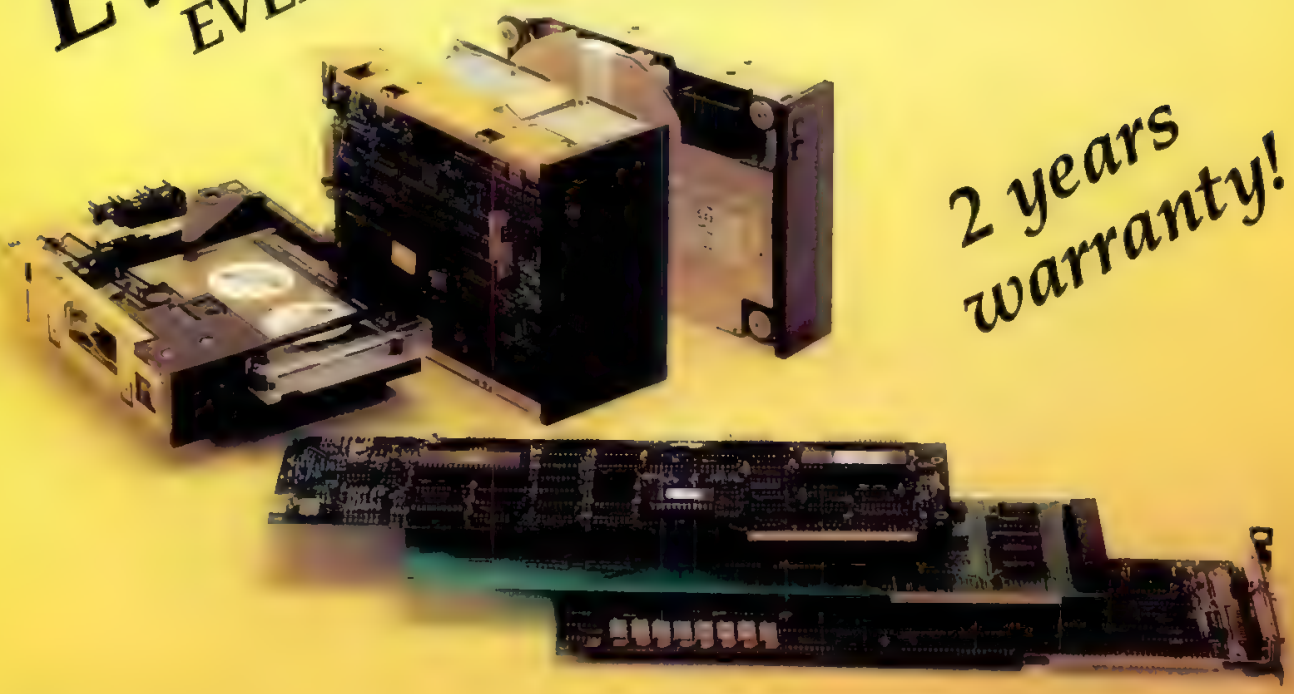
Select's *4-1-1* is a file retrieval system that creates a database of every word used in every document filed in the system. For example, when a word such as *publisher* is queried, the system will list all stored documents containing that word.

Select's *4-1-1* is available for the IBM PC-XT and other IBM compatibles with hard disks and 256K RAM. It works with files created by *WordStar* and all Select writing systems, including *Select Bilingual*, *Select Write*, the new *Freestyle* writing system, and all software that generates ASCII-like files. Retail price is $149.

Select's second addition is *Freestyle*, an outline-based writing system designed to help prepare lengthy documents. *Freestyle* also has a Draw feature that creates line drawings, arrows, and shading by moving the cursor keys.

Freestyle is available for the IBM PC and PC-XT with 192K RAM for $295. ■

EVEREX
EVER for EXcellence



2 years warranty!

Everex Storage Subsystems Plug Right Into Your Business!

Everex combines **Reliability, Support, Ease of Use and Best Price Performance Ratio** into a full product line of internal storage subsystems and plug-in controller cards. Now you have no excuse not to turn your IBM® PC into an XT! Actually, **more** than an XT, when you combine our **Half-Height** hard disk with our **Half-Height** streaming tape.

Hard to believe? Well, believe this, both the hard disk and streaming tape **Plug Right Into Your System**. Incredible? Unique? That's EVEREX for you.

Plug-in Subsystems

- Hard Disk Drive with Everex Controller Card — we're offering you anywhere from 10–40MB of storage, in half or full height, that you can directly plug into your PC with **No Software Patch Required**. And we are so confident of our Hard Disk Drive that we are backing it with a **FULL TWO-YEAR WARRANTY.*** All this starting at a LOW suggested retail of $1,195!

- Streaming Tape with Everex Controller Card — you get 20–45MB of high-performance back-up storage in minutes. And REMEMBER, this is a half-height streamer! The price is something to remember too — starting at ONLY $1,135 suggested retail.

Combined with the half-height hard disk, you've got something you can really talk about — an XT that backs itself. Only from Everex.

Controller cards sold separately:

- ULTRA DISK™ — Controls both the hard disk and floppy disk drives **at the same time**, saving you both space and money. Suggested retail — $525.

- Floppy Disk Controller — easy to install at $220 suggested retail.

- Streaming Tape Controller — direct plug-in and very reliable. Suggested retail — $315.

Want to know more? Just ask your local dealer for all the details.

*Two-year warranty on Hard Disk Drive, one-year warranty on the controller card.

See us at Booth #1210
COMDEX™/Fall '84
November 14-18, 1984
MGM Grand Hotel
Las Vegas, Nevada

OEM Inquiries Welcomed.

Price subject to change without notice.

AD-102

OEM and Dealer Hotline 800-821-0806. In California call 800-821-0807.

Everex Systems, Inc. **891 Maude Ave., Mountain View, California 94043 (415) 967-1495**

CIRCLE 227 ON READER SERVICE CARD

IBM is a registered trademark of International Business Machines Corp.
Ultra Disk is a trademark of Everex Systems, Inc.

from MicroComputer Accessories, Inc.

TOP DRAWER!

Absolutely first class. Our Keyboard Storage Drawer is tops—it can turn your narrow credenza or typewriter return into a perfect work station. From a reinforced platform on protective felt pads, the cantilever drawer extends on industrial strength ball bearing glides and locks into working position. The scratch resistant finish matches IBM colors. Optional locking device. Also available—an under-desktop suspension model—the bottom drawer. But still "top drawer!"

MicroComputer Accessories, Inc.

5721 Buckingham Parkway
P.O. Box 3725
Culver City, California 90231
Telephone 213/641-1800

In Europe:
N.V. Microcomputer Accessories Europe S.A.
Rue de Florence 37
1050 Bruxelles, Belgique
Telephone 02/538.61.73

These and other fine products are available at Sears Business Systems Centers, Computerland, Businessland, IBM Product Centers and other computer/software retail locations.

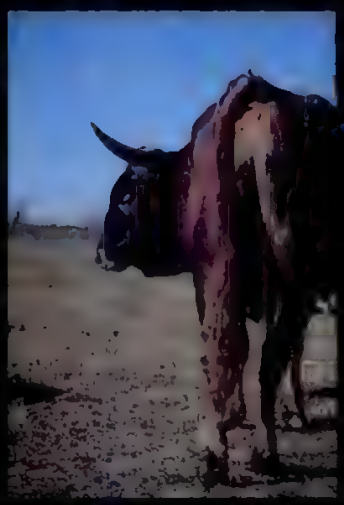
Computer Security Alarm

Rotary 100 Disk File

COVER YOUR TAIL!

Are you unnecessarily exposed? Could you accidently format your hard disk or copy over valuable data for which you have no backup? Are you working with national security or client data which must not be compromised? Do you have valuable corporate plans and records that you want to keep confidential?

SysteMate, the **SOFTWARE INTEGRATION AND SECURITY SYSTEM,** offers a comprehensive set of security tools that span user needs from the home user through the largest corporate user. Features that will help you prevent security abuses, include:



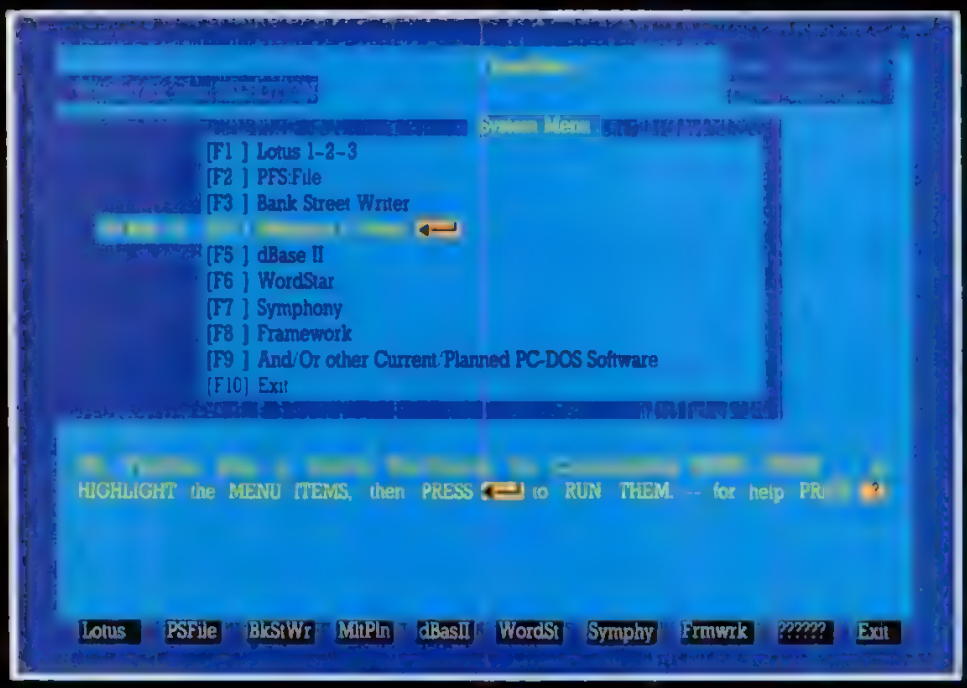
- **Authorization Codes:** Authorization codes can be required to authorize changes to SysteMate menus.
- **User Access Codes:** SysteMate can be set up so that at "sign on" a user number and user code are required.
- **Passwords:** Any menu item can be protected with its unique password. Thus, users have the ability to set up virtually any type of hierarchical password system, limited only by need and creativity.
- **Program/Subsystem Lock:** SysteMate uniquely allows you to lock programs and data so that they can only be accessed through SysteMate. Users cannot circumvent the security system by using their knowledge of DOS, because the SysteMate Security locks prevent access through DOS.

One way to cover your tail: On a hard disk system, you could set up a menu item to format diskettes on drive A: and require an authorization code so that the format menu item could not be altered without credentials. You could also require a password in order to execute that format menu item. You could then lock the format program so that it could not be used directly with DOS; users would have to go through SysteMate to format diskettes. With that implementation, it would be virtually impossible to format your hard disk, unless you unlock the format program. Other similar errors or problems can be prevented by using these SysteMate techniques and methodologies.

And SysteMate is much more than just a security system. We call it SysteMate, because that is what it does — it mates software and hardware together into an **INTEGRATED SYSTEM.** The system virtually eliminates the need to know and understand PC-DOS. It is very easy to install and operate, with superb documentation.

FEATURES: System security components, diskette labeling, label checks before mounting, definable screen prompts for training, pre and post execution instructions, and it allows Lotus and your wordprocessor, and/or any other combination of applications, to access common data files. It will operate on diskette, hard disk or ultra high speed RAM disk systems, color or monochrome.

So Cover Your Tail with a SysteMate order today !



47.00

Suggested Retail Price

Add $5.00 per order for shipping and handling.

SysteMate, Inc.

TWIN TOWERS EAST
MARKETING SUITE 200
1106 CLAYTON LANE
AUSTIN, TEXAS 78723-1033
(512) 458-6202

ORDER TOLL FREE "24 HOURS/DAY"

1-800-824-7888-OPERATOR 806
In Alaska/Hawaii 1-800-824-7919
(MC, VISA, OR C.O.D.)

DEALER/DISTRIBUTOR INQUIRIES WELCOME

LOTUS™ and Symphony™ are trademarks of Lotus Development Corp.
Wordstar™ is a trademark of MicroPro International Corp.
Bank Street Writer™ is a trademark of Broderbund Software, Inc.
dBaseII™ and Framework™ are trademarks of Ashton-Tate
Multiplan™ is a trademark of Microsoft

CIRCLE 461 ON READER SERVICE CARD

SysteMate™ is a trademark of SysteMate, Incorporated
PFS File™ is a trademark of Software Publishing Corporation

Copyrighted material

Perfect Compatibility

IBM™ & ACP

HARDWARE SPECIALS

CONTROL DATA
Full Size 320K DS/DD . . . . $ 209*
*"The drive IBM trusted with its logo"

TEAC
Half-Height 320K DS/DD . . . $ 179
"The #1 Rated Half-Height Drive"

64K RAM Chips 200ns Pre-Tested $ 55

AST SIXPACK w/384K . . . . . $ 569

MAYNARD ELECTRONICS
10MB HARD DISK
(XT Lookalike) . . . . . $ 949

SOFTWARE SPECIALS

LOTUS 1-2-3/WORDSTAR PROPACK . . . . . $ 639

LOTUS 1-2-3/HERCULES GRAPHICS CARD . . . . . $ 679

SYMPHONY/SIXPACK W/384K . . . . . $ 999

MULTIMATE w/80K Word Speller . . . . . $ 269
An advanced word processor with all the features of a dedicated stand alone system.

dBASE III/QUICKCODE/dUTIL . . $ 629

dB/COMPILER . . . . . $ 450
Neither dBase II nor Run-Time required. 30% less storage, faster execution assembly language interface

EASYWRITER II/SPELLER/MAILER . . . . . $ 195

We carry a wide variety of Mainframe Communication and Local Area Networks. For advice about which will suit your needs best give us a call and let us review them with you.

HARDWARE

COMPUTER SYSTEMS

IBM
PC w/256K 2 DS/DD Disk Drives . . . . . $ Call
PC w/256K 1-360K Drive
1-10MB Hard Disk . . . . . $ Call

COMPAQ
w/256K 2 DS/DD Disk Drives . . . . . $ Call

COMMUNICATION PRODUCTS

HAYES
Smartmodem 300 . . . . . $ 209
Smartmodem 1200 . . . . . $ 489
Smartmodem 1200B w/Smartcom II . . $ 419
Smartmodem-to-IBM 6 ft. Cable . . . . . $ 25
Smartcom II . . . . . $ 99

TAC
Irma (Emulates 3278 Terminal) . . . . . $ Call
Irma Line (For Remote Emulation) . . . $ Call

FLOPPY & HARD DISK DRIVES

CONTROL DATA
Full Size 320K DS/DD . . . . . $ 209
Half-Height 320K DS/DD w/Bracket . . . $ 179

DAVONG
10 MB to 41 MB Hard Disk Int./Ext. . . . $ Call

IOMEGA
Bernoulli Box (10 or 20MB) . . . . . $ Call

TALLGRASS
12—70 MB Hard Disk w/Tape Backup . . $ Call

TEAC
Half-Height 320K DS/DD w/Bracket . . . $ 179
Half-Height 640K DS/DD w/Bracket . . . $ 265

MAYNARD ELECTRONICS
10MB Hard Disk WS-1 (XT Lookalike) . . $ 949
10MB Hard Disk WS-2 (XT Lookalike) . . $1149

DISKETTES

SCOTCH 3M
DS/DD Box of 10 . . . . . $ 35

VERBATIM
DS/DD Box of 10 . . . . . $ 35

DISK CONTROLLERS

MAYNARD ELECTRONICS
Standard Disk Controller . . . . . $ 115
with Parallel Port . . . . . $ 165
with Serial Port . . . . . $ 175
Sandstar Modular Disk Controller . . . . $ 209
All Sandstar Modular Options Avail. . . $ Call

EXPANSION BOARDS

MAYNARD ELECTRONICS
Modular Memory Brd. w/64K to 576K . $ 219
Modular Multifunction Board . . . . . $ 95

AST RESEARCH
(All AST boards include SuperDrive, SuperSpool and 1 year warranty)
SixPack Plus w/64K to 384K . . . . . $ 269
MegaPlus II w/64K to 512K . . . . . $ 269
Memory Board II w/64K to 384K . . . . . $ 239
I/O Plus II . . . . . $ 139
MegaPack w/128K or w/256K . . . . . $ Call
Parallel, Serial, Game Options . . . . . $ 35

ORCHID TECHNOLOGY
Blossom w/64K to 384K . . . . . $ 249

TECMAR
Captain w/64K to 384K w/Software . . . $ 269

QUADRAM
Quadboard w/64K to 384K . . . . . $ 269

PRINTERS & PLOTTERS

C. ITOH
Starwriter Letter Quality 40 cps $1195
Printmaster Letter Quality 55 cps . . . . $ Call
Cut Sheet Feeder (Feeds 200 sheets) . . $ 445

EPSON
(All Printers include GRAPHTRAX-Plus)
RX-80 (120 cps, 80 cols) . . . . . $ Call
RX-80 F/T (120 cps, 80 cols) . . . . . $ Call
RX-100 F/T (100 cps, 132 cols) . . . . . $ Call
FX-80 F/T (160 cps, 80 cols) . . . . . $ Call
FX-100 F/T (160 cps, 132 cols) . . . . . $ Call
Epson-IBM Cable . . . . . $ 30

HEWLETT PACKARD
HP—7470A Two Pen Plotter . . . . . $ Call
HP—7475 Six Pen Plotter . . . . . $ Call
HP-IBM Cable (works w/Lotus 1-2-3) . . $ 50

NEC
NEC 3550 Letter Quality 35 cps $1699
NEC 2050 Letter Quality 18 cps . . . . . $ 895
Bi-Directional Tractor . . . . . $ 235
Cut Sheet Feeder (Feeds 200 Sheets) . . $ 445
NEC-IBM Cable . . . . . $ 30

OKIDATA
Microline 83A (120 cps, 132 cols) . Best Price
Microline 92 (160 cps, 80 cols) . . . Best Price
Microline 93 (160 cps, 132 cols) . . Best Price
Microline 84 (200 cps, 132 cols) . . Best Price
Plug n' Play . . . . . Best Price
Okidata-IBM Cable . . . . . $ 30

SILVER-REED
EXP 550 (20 cps, 132 cols) . . . . . $ 595

MONITORS

AMDEK
Video 300 Green Screen . . . . . $ 140

- No Credit Card Surcharge
- Special Corporate Accounts Division
- Company P.O. Accepted
- Training
- Equipment Maintenance
- Next Day Shipping

WE'LL GIVE YOU $10.00!

Simply refer to this reference number–PM1 with your order and receive $10.00 credit toward your next purchase.*

*Minimum order $100.00. Limit one credit per customer

Ref. #PM1

Video 300A Amber Screen ..... $ Call
Video 310A IBM Monochrome in Amber ..... $ 170

PRINCETON GRAPHICS
HX-12 RGB Hi Resolution Color ..... $ 499
Max-12 IBM Monochrome in Amber .. $ Call
SR-12 Hi Resolution Color ..... $ Call

VIDEO—MONITOR BOARDS

HERCULES	Graphics Card	$ 359
	Color Card	$ 179
PC COMPONENTS	Bi-Graphix I	$ Call
PARADISE SYSTEMS	Multidisplay	$ 339
PC+ PRODUCTS	Colorplus	$ 419
STB	Graphix Plus	$ 389
QUADRAM	Quadcolor I	$ 199
TECMAR	Graphics Master	$ 499

MISCELLANEOUS

Cables (all extension cables) ..... $ Call
8087 Co-processor ..... $ 179

KEY TRONIC
Deluxe Keyboard (KB 5151) ..... $ Call
KOALA—Touch Tablet w/Software .... $ Call
KRAFT—Joystick ..... $ 49
T.G.—Joystick ..... $ 49
MOUSE SYSTEMS—PC Mouse ..... $ Call

SOFTWARE

ALPHA
Database Manager II ..... $ 199

ASHTON TATE
dBase II ..... $ 285
dBase III ..... $ Call
Framework ..... $ Call

ATI
All Software Training Pkgs ..... $ 55

BORLAND INT'L
Turbo Pascal ..... $ 45
Sidekick ..... $ 45

CENTRAL POINT SOFTWARE
Copy II PC ..... $ 35

FOX & GELLER
Quickcode II or III ..... $ 169
dGraph (Requires Graphics Card) .... $ Call
dUtil (Utilities For dBase II or III) ..... $ Call
FUNK—Sideways ..... $ 49
HAYES—Smartcom II ..... $ 99
IMSI—4 Point Graphics (Rated #1) ... $ 119
(Inhance Lotus Graphics)

INDIVIDUAL SOFTWARE
Tutorial Set (IBM PC/XT and DOS) .... $ 79
Typing Instructor ..... $ 39

INFORMATION UNLIMITED SOFTWARE
EasyWriter II System (See Specials) .. $ 195
Accounts Receivable ..... $ 299
Accounts Payable ..... $ 299
General Ledger ..... $ 299
Payroll ..... $ 369

INFOCOM—Zork I, II, III ..... $ 29
All games available ..... $ Call

LATTICE
C-Compiler ..... $ 299
C-Food Smorgasboard ..... $ 110

LIFETREE
Volkswriter Deluxe w/TextMerge ..... $ 169

LIGHTNING SOFTWARE
Master Type (Best Typing Tutor) ..... $ 39

LOTUS DEVELOPMENT
Lotus 1-2-3 (Version 1A) ..... $ Call
Symphony ..... $ Call
Symphony Upgrade ..... $ Call

MICRO DATA BASE SYSTEMS
Knowledgeman ..... $ 299

MICROSOFT
C-Compiler ..... $ 349
Flight Simulator ..... $ 35
Multiplan (New Version) ..... $ 149
Project (Project Manager) ..... $ 180
Chart ..... $ 180
Word ..... $ 239
Word w/Mouse ..... $ 299
Mouse w/Software ..... $ 139

MICROPRO
Wordstar w/Tutorial on Disk ..... $ 229
ProPack (Wordstar/MailMerge/CorrectStar/StarIndex) ..... $ 329
ProfessionalPlus (ProPack plus TelMerge Electronic Mail System Mailing List Management and Business Letters) ..... $ Call

MICRORIM
R.base 4000 ..... $ 299
Clout ..... $ 139
Extended Report Writer ..... $ Call

MICROSTUF
Crosstalk XVI (for Hayes Smartmodem) ..... $ 99

MORGAN COMPUTING
Trace 86 (Assembly Language Debug) $ 99
Ted (Program Editor) ..... $ 79
Professional Basic (170K Work Space w/8087 Support) ..... $ 259

MULTIMATE INTERNATIONAL
Multimate (See Specials) ..... $ 269

PETER NORTON
Norton Utilities ..... $ 55

ROSESOFT
Prokey (Newest Version) ..... $ 95

SOFTWARE PRODUCTS
Open Access ..... $ 299

SATELLITE SOFTWARE INTERNATIONAL
Word Perfect (includes Speller) ..... $ 269

SORCIM
Supercalc 3 ..... $ 199

SOFTWARE PUBLISHING
PFS/Access ..... $ 65
PFS/File ..... $ 89
PFS/Graph ..... $ 89
PFS/Report ..... $ 79
PFS/Write ..... $ 79

TALL TREE SYSTEMS
J-Format 2.0 ..... $ 40

WORDTECH SYSTEMS
dB/Compiler (True dBase II Compiler) ..... $ 450

WANG PUBLICATION
Random House Proof Reader (50K) .. $ 45

Our Policy

• We accept VISA, Mastercard, Money Orders, Certified Checks, Cashiers Checks, Personal Checks, Wired Funds • We do not charge your card until we ship • **No surcharge added on VISA and Mastercard** • Allow one week for personal and company checks to clear • COD maximum $500 Cash or Certified check on delivery • Please use local phone number for order status inquiries • Prices subject to change without notice • Returns may be subject to restocking fee.

SHIPPING (U.S.). For monitors, printers, and hard disk drives add 2% to all orders. Blue label and Next Day Air available. For all other items add $4. **Most orders shipped next day.**

APPLIED COMPUTER PRODUCTS INC.

1916 Welsh Road #6, Philadelphia, PA 19115
215-934-6990 Telex 756876 UD

1-800-223-3860

When you need competitive prices, prompt service and complete support, call us.

*IBM is a registered trademark of International Business Machines.

CIRCLE 142 ON READER SERVICE CARD

Lotus Urges Others To Finish Symphony

Software and seminars give independent developers tools to create new functions

BY ROBERT SEHR

SAN FRANCISCO—Independent software developers have been asked to complete what Lotus Development Corp. officials admitted was an "unfinished" *Symphony*, with some unprecedented help from the company that had kept the rewards of *1-2-3* to itself.

"Together we can reach a market that we cannot reach by ourselves," David Gilmour, director of product planning told more than 100 software developers and programmers in San Francisco who paid $75 apiece to share some previously classified programming codes for Lotus's new integrated spreadsheet, database, business graphics, and word processing package. The San Francisco seminar followed two similar seminars held in Boston the previous week.

Lotus, which appeared out of nowhere and became an overnight success with its top-selling *1-2-3* spreadsheet, business graphics, and database program, hinted to the developers that this was an opportunity to share in the expected success of *Symphony*. "We want to leave you with the impression that *1-2-3* and *Symphony* are your best allies for successful upward growth," Gilmour noted.

Although some software houses have shared codes with major independent developers with an eye to making joint marketing agreements, this is the first time a developer has made a pitch to the entire independent software community. In its three-pronged incentive program, Lotus will make available a *Worksheet File Format* program for *1-2-3* and *Symphony*, a command-language library manager, a *1-2-3* macro conversion aid and range input add-in for *Symphony*, and, finally, add-in tools that include object codes to control *Symphony* capabilities.

However, Lotus placed some limits on the availability of the developer tools. The *Worksheet File Format*—a technical description that allows the creation of files that can be read by *1-2-3* or *Symphony*—will be made available to the general public for $20. (Those who paid to attend the seminar will receive it at no charge.) The add-in tools, which allow developers to control data locations and formats, range names, and various worksheet settings, will be available on a much more limited basis.

"We want to know something about the developers who will be using these tools," Gilmour explains. "We have limited support resources, and we want to use them in the most efficient manner."

Gilmour added that developers will have to apply for the right to use the add-in tools, giving evidence of their programming expertise and their familiarity with *Symphony* and the *Symphony* command language. Developers chosen to use the add-in tools will be responsible for marketing and distributing their own products. "We will act only as a nonjudgmental information conduit."

The command-language library manager, *1-2-3 Macro Conversion Aid*, and range input add-in for *Symphony* will be distributed to the general public, but not before the first quarter of 1985. The command-language library manager will allow programmers to create *Symphony* programs that are stored and executed separately from *Symphony* worksheets. The *1-2-3* macro conversion will simplify the conversion of *1-2-3* macros into the *Symphony* command language, and the range input add-in will give *Symphony* the ability to designate part of the worksheet for data entry (as *1-2-3* already does).

Lotus's main rival, Ashton-Tate, creator of *Framework*, has not made a similar gesture to developers. "We don't have to give out any codes to attract developers," says Ron Arons, product manager for Ashton-Tate. Arons cited the large number of third-party software developed for *dBASE II* and added that Ashton-Tate has already talked to key developers to start such efforts on behalf of *Framework*.

Gilmour says that sharing *Symphony*'s object code with developers is not intended to make the package—which is already enjoying healthy sales—the industry standard. "It is a gesture of openness based on the hope that these developers can get to more markets than we can; maybe they can make better *Symphony* add-ons."

Even *Symphony*'s capabilities are not enough for the present personal computer market, Gilmour told the developers. He cited a Yankee Group study that revealed that 68 percent of personal computers are being used for an average of less than half an hour per day. "I think that's a shame," he noted. "I believe that is a threat to the growth of this industry." ■

Diablo Connects to DisplayWrite 2

NEW YORK—Diablo Systems Incorporated has a software program that will allow its daisywheel printers to work with IBM's new *DisplayWrite 2* word processing system for the PC.

The program works by allowing Diablo models that have its All-Purpose Interface feature to emulate an IBM 5218 printer, which is supported by *DisplayWrite 2*. Features supported include all word processing modes, such as boldface, shadow and underscored printing in various pitches, proportional spacing, stop codes for print wheel changes, and Diablo's dual-bin sheet feeder.

The program was fully tested with a Diablo 630 and will be tested with other models. Marketing plans will be forthcoming.

In XT Showdown, Tandy's Tactic Is Compatibility

FORT WORTH, Texas—In mid-September the Tandy Corporation made an "informal" announcement telling its retailers to expect a PC-XT compatible machine within a month. The $3,000 hard disk unit, christened the 1200 HD, includes Microsoft BASIC and 256K RAM.

With 450 Radio Shack computer stores and another 900 computer departments nationwide, the 1200 HD already has a formidable distribution system in place. The ad campaign is expected to center upon the price, which is one-third less that the cost of the XT, but Tandy sources are already saying that their new machine is "better built and more reliable" than its IBM competitor.

The 1200 HD will be sold alongside the Tandy 2000, an MS-DOS machine with a disk format that is incompatible with IBM computers. Tandy sources say that the 1200 HD has a "very high level" of IBM compatibility.

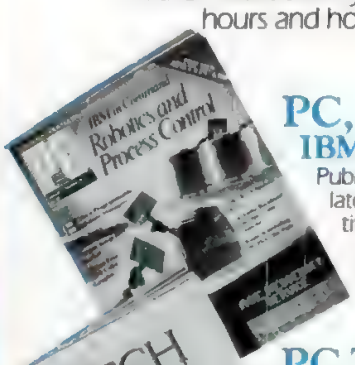
"With an aggressive price and distribution, we hope to capture a significant part of the XT market," said Van Chandler, Tandy's director of merchandising for business computers.

Chandler declined to give either an exact or expected release date, saying "anything can go wrong in the computer industry." One Radio Shack dealer confirmed that the company had promised to have the machine in stores by mid-October.

—Charles Bermant

THE IDEAL GIFT FOR ANYONE WHO OWNS OR USES AN IBM PC!

Give the gift that lasts all year!
If there's a PC user you know who can use innovative new ideas and applications – as well as the latest information – give them the gift that arrives in their mailbox all year long! Give them a PC magazine that will provide hours and hours of facts, information and new ideas! Give –



PC, The Independent Guide to IBM Personal Computers

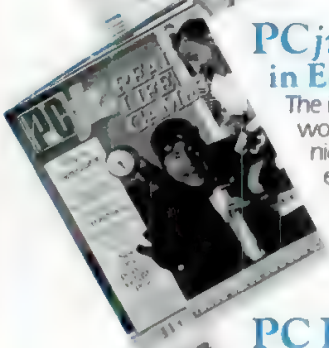
Published every-other-week to provide the timeliest information and the latest news taking place in the IBM PC market with applications, innovative programming concepts, PC News and the Norton Chronicles!

26 issues (one year) only $29.97. Save $5 off the full one-year price!

PC TECH JOURNAL

For the advanced IBM PC user and MIS/DP professionals. PC TECH JOURNAL provides high-level, advanced programming techniques and concepts, sophisticated telecommunications protocols and in-depth analysis of IBM PC technology.

12 issues (one year) only $24.97. Save $5 off the full one-year price.



PC*jr.*, The Independent Guide to the IBM PCjr in Education, Home and Business

The ideal magazine and gift for anyone who uses the IBM PCjr in school, work or at home! New ideas...innovative applications...and proven techniques to expand the memory and functions of the IBM PCjr are found in every issue! If you're looking for a way to have your friend's PCjr grow up, this is the gift to give!

12 issues (one year) only $14.97. Save $10 off the full one-year subscription price.

PC DISK

Give over $1400 worth of programs for as little as $149 with PC DISK, the continuous software library on diskette for the IBM PC, PCXT, PCjr and compatibles! Every six weeks a new floppy disk will be delivered to your recipient's door with up to 7 new business, education, personal management and recreation programs! An ideal gift for all PC users!

6 disks only $149. Save over $60! 3 disks only $84. Save over $20!
(Use your credit card or enclose payment and deduct an additional 10% for your PC DISK gift!)

FOR FAST SERVICE CALL TOLL FREE 1-800-852-5200
or use the attached order card and order today!
Attractive signed gift card will be sent in your name.

PC4762-5

MICROXPRESS

EXPANSION BOARDS

AST	List	M/X
Sixpak 64K CC, S,P.	$395	$269
Megaplus 64K CC, Ser.	$395	$270
I/O Plus 64K CC, Ser.	$165	$129
Combo Plus 64K	$395	$308
Megapak 256K	$395	$310
Monograph Plus	$495	$429
PERSYST		
SB64	$395	$244
QUADRAM		
Quadboard I OK	$395	$240
Quadboard II OK	$395	$240
Expanded Quadboard OK	$295	$240
Quad 512 + 64K	$325	$265

HARD DISK

TANDON		
TM 502 Int. 10MB	$945	$795
TM 503 Int. 15MB	$1295	$900
TM 5112 10MB System	$1495	$1095
TM 5113 15MB System	$1995	$1395
MAYNARD Internal Subsystems		
WS1 10MB W. MFC	$1395	$1070
WS2 10MB W. FDC	$1595	$1140
WS3 10MB W. Mod Mem	$1595	$1140
Apollo 30MB	$2995	$2150
INTERFACE External Subsystems		
I2 BM 10 Meg	$1595	$1395
I2 BM 15 Meg	$1895	$1695
Percom Data 10 Meg	$1595	$1295
Percom Data 15 Meg	$1895	$1495

PRINTERS

CITOH		
40 & 55 CPS	CALL	CALL
EPSON		
RX80	$299	$295
FX80	$699	$525
RX100	$299	$295
FX100	$895	$699
LQ1500	$1395	$1295
BROTHER/DYNAX Letter Quality		
HR25 Par	$845	$810
Ser.	$845	$810
Tractor	$149	$98
DX15 Par	$499	$475
Ser.	$499	$475
Tractor	$120	$89
NEC		
3550	$2250	$1650
OKIDATA		
ML 82A	$499	$350
ML 83A	$749	$660
ML 92	$599	$505
ML 93	$895	$500
TOSHIBA		
P1351	$1895	$1585

SOFTWARE UTILITIES

TALL TREE		
J Format-2	$60	$40
Windrive	$60	$40
Jetdrive	$60	$40
J Spool	$60	$40

DISK DRIVES

CONTROL DATA	List	M/X	
9409 Full Ht. 5¼" DS DD	$525	$199	Full Height
9428 Half Ht. 5¼" DS DD	$345	$179	Drive Shown.

DISK DRIVE CONTROLLERS

MAYNARD	List	M/X
FDC 5¼"	$195	$140
FDC 8"	$245	$189
FDC 8 P	$315	$250
MAYNARD Sandstar Series		
Mod MFC	$110	$79
Mod FDC	$265	$179
Mod Mem OK	$230	$169
Hard Disk Mod.		$395
Par. Port Mod.	$75	$45
Ser. Port Mod.	$105	$78
Game Port Mod.	$60	$40
Clock Cal. Mod.	$90	$45

COLOR/GRAPHICS CARDS

HERCULES		
Monochrome	$499	$350
Color Card	$245	$175
STB		
Super Rio	$689	$499
Rio Plus	$665	$499
Graphics Plus	$395	$285
Graphics Master	$695	$545
PLANTRONICS		
Colorplus	$559	$395
QUADRAM		
Quadcolor I	$295	$210
Quadcolor II	$275	$199
TECMAR		
1st Mate 64K	$389	$275
Captain 64K	$424	$324
Graphics Master	$675	$545
USI PARADISE		
Multi Display	$595	$395
Modular	$395	$365

COMMUNICATIONS

AST		
PC Net	$1090	$920
5251	$790	$599
3780	$895	$675
CC232	$315	$275

MISCELLANEOUS

TG PRODUCTS	
Joystick	$49
WICO	
IBM PC Mouse	$70
KOALA	
Touch Tablet	$99
CDC	
Diskettes, Box of 10	$28
MEMORY	
64K, Set of 9 Chips	$100 $45

DISK DRIVES

For your IBM PC or compatible.

AMDEK 5¼" Floppy	List	M/X
Amdisk V Half Ht. DS DD	$358	$180
QUME 5¼" Floppy (PC Jr.)		
142 A8 Half Ht. DS DD	$345	$205
TEAC Half Heights		
FD 55-B DS DD	$349	$189
FD 55-F Quad	$449	$212
FD 55-G 1.6MB	$395	$295
PANASONIC Half Height		
For Apple	$209	$150
TANDON 5¼" Floppy		
TM 100-2 Full Ht. DS DD	$650	$199
TM 101-4 Full Ht. Quad	$345	$265
TM 50-2 Half Ht. DS DD	$325	$200
TANDON 8" Floppy		
TM 848-1E		$325
TM 848-2E		$395
DATA COMPASS 8" Subsystem		
I 8480 2 Drives	$1990	$1295
I 8481 1 Drive	$1300	$885

MONITORS

PRINCETON GRAPHICS		
HX12 RGB	$795	$490
SR12	$799	$635
Scandoubler	$249	$206
MAX 12	$249	$199
AMDEK		
300 G	$200	$140
300 A	$210	$150
310 A	$230	$175
Color I	$379	$299
Color II	$529	$475
Color 300	$399	$300
Color 500	$525	$469
Color 600	$649	$569
Color 700	$749	$669

MODEMS

NOVATION		
Smart Cat 212	$595	$415
ANCHOR		
Signalman Mark XII	$399	$269
HAYES		
Smartcom 1200	$699	$475
Smartcom 1200B	$599	$419
Smartcom II Software	$149	$105
QUADRAM		
Quadmodem Int.	$595	$570
Quadmodem Ext.	$695	$625

TERMS & CONDITIONS: Micro Xpress will accept VISA, M/C, C.O.D., Cashier's Check only. P.O. from Corp., University, Large Co. Terms, Net 20. Add 2% shipping & handling plus 3% for credit cards. Micro Xpress will also accept prepaid Co. check or wire trans. Micro Xpress will warranty every product for 90 days from the purchase date.

Micro Xpress carries other products in addition to above listed

Prices subject to change.

Call Toll Free
1-800-632-8515
Inside California
1-714-632-8512
For Technical Assistance
1-714-632-8996

CIRCLE 341 ON READER SERVICE CARD

MICROXPRESS
2730-A Regal Park Drive
Anaheim, CA 92806
Hours: 8 am - 5 pm Mon.-Fri. • 10 am - 6 pm Sat.

Your Peripheral Source!

NO OTHER LETTER-QUALITY PRINTER CAN TOUCH OUR NEW SPINWRITER FOR SPEED AND EASE-OF-USE.

CHANGE FORMS LENGTH AT THE PRESS OF A BUTTON

Introducing the Spinwriter 8850.
Our newest, and fastest, Spinwriter® printer operates at over 550 words-per-minute. And is extraordinarily easy to operate.

For one thing the Spinwriter 8850 takes care of basic settings such as pitch and forms length automatically. Of course you can also change either one at the touch of a button. It also has a unique control panel. With large, legible alphanumeric LED's to indicate the specific operating status. And make it simple for even an unfamiliar operator to use.

THE 8850 JOINS THE HIGHLY-RELIABLE SPINWRITER LINE

UNIQUE LED DISPLAY TELLS USER EVERYTHING FROM THE FACT THAT PAPER IS OUT

TO THE FACT THE COVER IS OPEN

And, of course, the 8850 has all the features, quality and reliability that make a Spinwriter a Spinwriter.

The first choice of IBM PC users.
The Spinwriter printer was the first totally plug compatible letter-quality printer available for the IBM® PC. It's still one of the few that works with all IBM PC software, as well as all other popular packages. You'll notice even its looks are compatible.

Spinwriter printers also give you capabilities you won't find on other printers. Like a selection of 80 different print styles.

And, nine easily installed forms handling options that can accelerate your printed output even more. Spinwriter printers also have an enviable record for reliability.

In fact, several years without a failure is not unusual. No wonder there are more Spinwriter printers hooked up to IBM PC's than any other letter-quality printer.

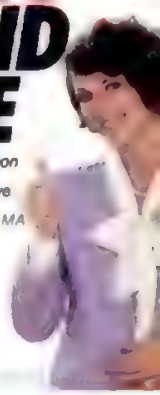
How to get up to speed.
For more information on the Spinwriter 8850 or our two companion models, just call NEC Information Systems at: 1-800-343-4419; in Massachusetts call (617)264-8635. Also available at: Entre, 1-800-HI ENTRE: Sears Business System Centers, 1-800-228-2200; and Computerland stores. (In California) 1-800-321-1101; (Outside California) 1-800-423-3308.

THE 8850 PLUGS RIGHT INTO THE IBM PC

Find out why more and more IBM PC users are saying, "NEC and me."

NEC AND ME

NEC Information Systems, Inc
1414 Mass. Ave
Dept. 1670
Boxborough, MA
01719



Spinwriter is a registered trademark of NEC Corp. IBM is a registered trademark of International Business Machines Corp.

CIRCLE 342 ON READER SERVICE CARD

Carriers Are Willing But Users Waiting on E-Mail

Western Union, MCI, GTE, ITT, Federal Express put various packages into electronic mail box

BY VIRGINIA DUDEK

NEW YORK—Electronic mail is in—almost.

While communications experts offer mixed reviews on the immediate profitability of electronic mail, the long-run prospect is that vendors with enough money to ride out the lean times will see hefty returns once electronic mail becomes as ubiquitous as the telephone.

While the major vendors now average between 500,000 and 2 million messages per month, the portion of the market currently using any system amounts to less than 2 percent of potential users. Whether electronic mail will get integrated into the fabric of daily life is a question electronic mail's participants must gamble with. However, the situation improves with each additional personal computer user.

"When people say electronic mail is not doing well, the problem is their view of the market," says Steve Caswell, a principal at Trigon Systems Group, a Toronto, Ontario, consulting firm. "People's communications habits will change; it has nothing to do with electronic mail."

Caswell maintains that since 1980, all the elements of an electronic mail system have been in place. Although recent reports of major electronic mail carriers such as Western Union indicate low returns on current operations, Caswell says that electronic mail will take off. "If you intend to be a player, you've got to be there now."

Those big companies include established communications firms such as Western Union, ITT, GTE, and MCI Communications as well as overnight courier Federal Express. Caswell doesn't discount computer giants AT&T and IBM either.

E-COM Access

Even the U.S. Postal Service tried to establish an electronic mail service, but with limited results. E-COM (electronic computer originated mail) was introduced in January 1982 as a service for volume mailers who could send mail from data stored electronically. But E-COM had some limitations that prevented wide acceptance: users had to send at least 200 letters on the service, and they didn't have the option of inserting business reply envelopes. Despite the host of software packages written to compensate for the complex set of E-COM user commands, E-COM failed to live up to Postal Service expectations.

On June 1 the Postal Service announced that E-COM was open to bids from private parties wishing to buy or lease the system. Most likely, one or a group of companies that have developed E-COM software packages will assume management of the system in early 1985.

In the meantime, the future of electronic mail lies in the private sector and depends on the durability of the major telecommunications and electronic mail players. Observers estimate revenues from the overall services associated with electronic mail will be in the $5 to $10 billion range by the mid-1990s.

PCs Help

"Electronic mail is finally being perceived as a viable technology," says Randy Sherman, vice president of telecommunications at Creative Strategies, Inc., a San Jose, California, marketing research firm. "The installation of a base of personal computers, the increase in user friendliness, and the inefficiency of the postal mail system are forcing users to seek alternatives. Electronic mail will make a stronger showing as the applications, databases, and software provided by major companies make it more practical.

No one company will dominate the electronic mail market.

"There will be room for many," says Nina Berns, product marketing manager for Transend Corporation, a San Jose software publisher and hardware manufacturer. "Standards will be developed with the cooperation of most of the companies to handle mail interactively. Eventually, it will not matter if you send mail between different services."

Transmitters

Caswell points to a conference held in November on the implementation of technical and market standards, sponsored by the International Telephone and Telegraph Consultative Committee, the standards-making arm of the International

(continued)

This Mug's for You

For those people who can't stay away from their computers but need pots of coffee to keep them hacking through the night, there's now a way to satisfy both addictions at once. The solution: an MS-DOS coffee mug. This colorful mug is decorated with the entire set of DOS commands found on the MS-DOS Quick Reference Card.

The handy reference mugs cost $7.95 each, or $5.95 each for a case of 36 (a perfect gift for the late-working office crew). The MS-DOS mugs can be ordered from TechNovelty, 102 Fenway Rd., Columbus, OH 43214, (614) 888-7111.

—Jane Mintzer

Wordstar™ Wordprocessing and SuperCalc 3™ Integrated Spreadsheet now included Free with all Seequa computers.

SEEQUA SHOWS YOU HOW TO GET AN IBM PC FOR JUST $1595.

BUY A CHAMELEON BY SEEQUA.

The Chameleon by Seequa does everything an IBM PC does. For about $1000 less than an IBM.

The Chameleon lets you run popular IBM software like Lotus® 1-2-3™ and dBase II.® It has a full 83 key keyboard just like an IBM. A disk drive like the IBM. And a bright 80 × 25 character screen just like an IBM.

But it's not just the Chameleon's similarities to the IBM that should interest you. Its advantages should, too. The Chameleon also has an 8 bit microprocessor that lets you run any of the thousands of CP/M-80® programs available. It comes complete with two of the best programs around, Perfect Writer™ and Perfect Calc.™ It's portable. And you can plug it in and start computing the moment you unwrap it.

So if you've been interested in an IBM personal computer, now you know where you can get one for $1595. Wherever they sell Chameleons.

The Chameleon by

SEEQUA COMPUTER CORPORATION
8305 Telegraph Road
Odenton, MD 21113

Chameleon shown with optional second disk drive.

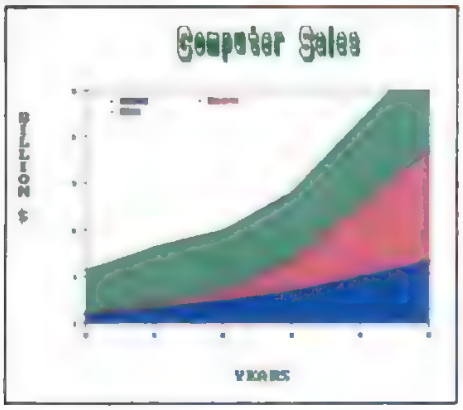
To learn more about Seequa or for the location of the Seequa dealer nearest you, call (800) 638-6066 or (301) 672-3600.

IBM is a registered trademark of International Business Machines Corporation.

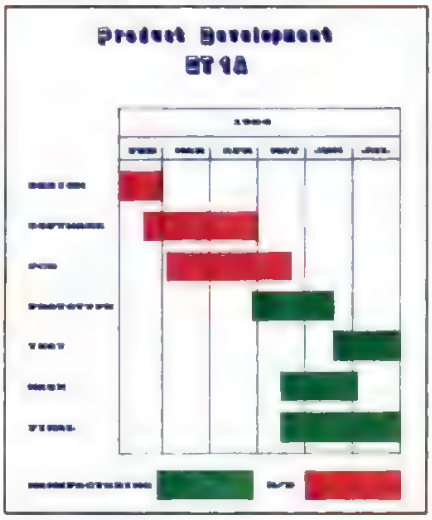
CIRCLE 370 ON READER SERVICE CARD

WHEN SPREADSHEETS DON'T GIVE YOU THE PICTURE...

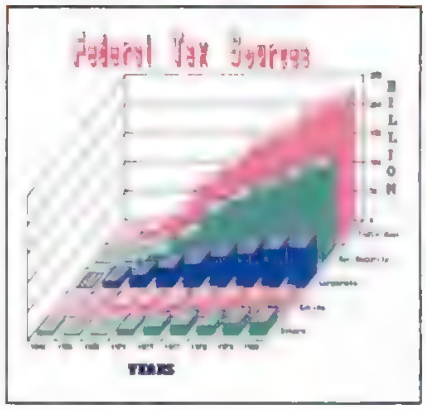
LINE CHARTS
STATISTICS



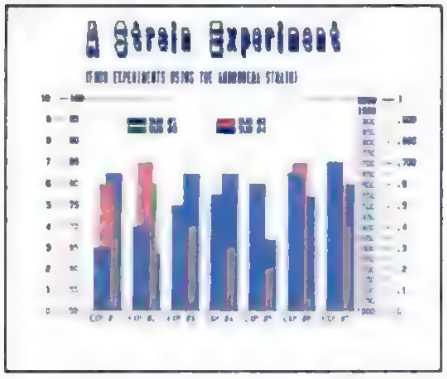
GANTT CHARTS
PROJECT SCHEDULING



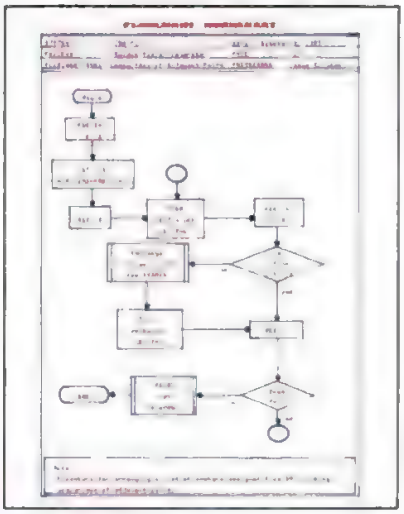
3-DIMENSIONAL
BAR CHARTS



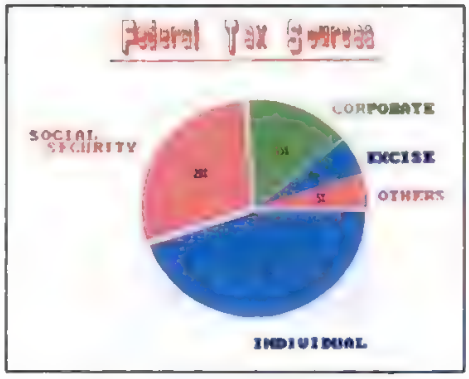
MULTI-SCALE BAR CHARTS
NEGATIVE BAR CHARTS



FLOW CHARTS
ORGANIZATION CHARTS



PIE CHARTS



* HARDWARE CONFIGURATION: IBM-PC, 128K; Dual Disk Drive; Graphics Adapter; Dot Matrix Printer; and/or XY Plotter; Compaq, Columbus and Eagle Computers.

*THE FIRST COMPLETE GRAPHICS PROGRAM DESIGNED FOR EVERY BUSINESS USE ON IBM-PC's**

ENERGRAPHICS™

Dynamic and so easy-to-use, ENERGRAPHICS is already helping business managers at 40 Fortune 500 companies. ENERGRAPHICS is used in Finance, Marketing, Sales, Advertising, Research and Data Processing. Both VisiCalc® and Lotus 123™ spreadsheet files interface with ENERGRAPHICS. For the first time business executives can plan, project, present, analyze and report with the best looking professional graphics available on the IBM-PC and compatibles.

VisiCalc is a registered trademark of Visicorp.
Lotus 123 is a trademark of Lotus Development Corp.

Call 800-325-0174
(except in Missouri)
for our detailed
ENERGRAPHICS brochure

ENERTRONICS

Enertronics Research, Inc.
150 N. Meramec • Suite 207 • St. Louis, MO 63105 • (314) 725-5566

CIRCLE 134 ON READER SERVICE CARD

Electronic Mail *(continued)*

Telecommunications Union.

Here are the major electronic mail carriers:

• Western Union—The EasyLink Instant Mail network can send and receive messages using a personal computer, microcomputer, or word processor equipped with modem and communications software. Subscribers can send messages throughout the world to a receiver's electronic mailbox or via several modes of hard copy: next-day Mailgrams, two-day E-COM delivery, first-class mail delivery of a computer letter, four-hour telegram, overseas cablegram or overseas priority letter delivered the next day by the British Post Office in the U.K. Like MCI Mail, EasyLink can operate between incompatible computer systems.

Western Union also has a communications software package, EasyLink Instant Mail, to help users manage word processing, address management, and disk filing on their personal computers. (EasyLink reports a strong lead in the market with a recorded 2 million message transmissions per month.)

• ITT—Direct Distance Dialing (DDD) allows owners of word processors, computers, or telex machines to send electronic messages to another similarly equipped terminal. The telex number is the code that identifies senders and recipients, although messages are sent over regular phone lines and not over the telex line. Messages are transmitted by modem to ITT's Timetran terminal and are then sent to the recipient. If the line is busy, messages can be stored in Timetran and then called upon when the recipient is ready to read incoming messages. DDD also has an interactive feature that transmits live messages overseas.

If the recipient does not have a computer to receive messages, telex users can send hard copy via ITT's Speedmail. It currently sends approximately 800,000 messages a month.

• GTE—Telemail sends messages in hard-copy form to other Telemail subscribers and to nonsubscribers. It delivers messages to any terminal connected to a domestic or overseas telex network, to the Western Union TWX network, as well as to any terminal linked via leased line to the Telenet public data network in the U.S. and other public data networks around the world. It also delivers on a dial-out basis to terminals with automatic answering equipment.

• MCIMail—MCI announced its electronic mail service in September 1983. Owners of personal computers or word processors can write messages off line and then send them via modem. Messages can be delivered either to another word processor or PC instantaneously, or as hard copy in 4 hours or overnight, or by first-class mail delivery.

MCI recently announced the MCI *Mail Access* software program for the IBM and compatibles. (See related story.) MCI also offers volume mail discounts and can include business reply envelopes and inserts if requested. Cost is $1 for a 7,500-character electronic letter, $2 for a printed letter delivered by the Post Office, $6 for overnight copy delivered by Purolator, and $25 if delivered within 4 hours by Purolator. Additional "MCI ounces" of 7,500 characters each cost $1 extra.

You can send messages between incompatible computers via MCI, and also to any telex machine. MCI sends about 700,000 messages each month.

• Federal Express—Zapmail, a facsimile transmission service, delivers documents within 2 hours. The document is physically picked up and taken to a Federal Express center, where a reproduction or "fax" of the document is transmitted to the nearest home office of the recipient. The document is then delivered by hand. The cost is $35 for one to five pages, and $1 each additional page if Federal Express picks up the package. The cost is $25 and $1 for each page over five if the customer takes the document to the Federal Express transmission site. The time allowed for delivery is then reduced to 1 hour.

Federal Express reports sending 6,500 Zapmail documents during its first month of operation. ■

PC Relational Database? New Answer Is Oracle

Users can either up or download PC applications from (or to) minis, mainframes

BY ROBIN WEBSTER

SAN FRANCISCO—Oracle Corporation has announced a version of its relational database that is "fully functional" for the IBM XT/AT systems and compatibles. The new version of *Oracle* allows dissimilar PC and mainframe systems running *Oracle* to share data, thanks to new networking software.

Oracle developed its original version of the database in the late 1970s. It claims that the product is "totally" compatible with IBM's own SQL/DS and DB2 mainframe databases. The high degree of compatibility is not surprising since *Oracle* developed the database according to IBM's own early SQL/DS specifications.

Now the company has introduced its PC-compatible *Oracle*. "We have managed to transport the full power of our larger *Oracle* relational database systems down to IBM XT, IBM PC AT, and similar machines," says Larry Ellison, president of Oracle Corporation. "Although we had to substantially rewrite the *Oracle* source code so that it could work well within the MS-DOS environment, nothing has been lost."

Big Capabilities

According to Ellison, "the user gets the same relational database facilities, the same report writing capabilities, and the same applications generator support. The mainframe, minicomputer, and microversions are all functionally identical."

The minimum hardware required to use *PC Oracle* is an IBM XT/AT with 512K of RAM. You'll need a 10-megabyte hard disk with at least 3 megabytes of free space, and one floppy drive.

What's important about this new version is that you will now be able to develop *Oracle* applications on, say, a mainframe and then download them for use on a standalone PC. Alternatively, you could develop applications on your PC.

Special networking software, called *Oracle Link*, makes the transfers possible. However, *Oracle Link* is not a simple file transfer program. It allows you to issue "real" database queries to remote *Oracle* databases. You can thus transport complete or partial database tables and user views between *Oracle* systems.

Squeezing *Oracle* to fit on the IBM XT and PC AT took about two years. The company had to create new software development tools to do the job. "The closest we had come to putting *Oracle* onto smaller computers was when we introduced versions that would work in 1 megabyte of RAM under UNIX," explained Ellison. "In attempting to develop an IBM XT/AT version, we looked at virtually every independently developed C compiler, editor, and debugger. We did consider using the Lattice C compiler at one time. In the end, though, we decided to develop our own internal C language tools."

PC Oracle costs $1,000 per user, but there is a minimum order of six user licenses (totaling $6,000). The price per user is close to that for bigger machines that run *Oracle*. The IBM 3084 version supports about 90 users and costs $96,000; the Digital Equipment Corporation VAX 780 version supports 40 users and costs $48,000.

Oracle said that it would begin shipping the IBM XT/AT and TI Professional versions of *PC Oracle* in October. ■

—ORDER DESK ONLY—
(800) 272-3360
TOLL FREE IN CALIFORNIA

Specializing in
Corporate Accounts

MC-P APPLICATIONS, INC.

The Best Computer Solution

The Best Prices - Best Service - Best Technical Support

—ORDER DESK ONLY—
(800) 292-3360
TOLL FREE OUTSIDE CALIF.

SOFTWARE

SPREAD SHEETS	
Lotus 1-2-3	$299
Symphony	425
Framework	372
Multiplan	135
Open Access	369
TK Solver	265
Supercalc III	195
Visicalc IV	157
Design Manager	475
DATA BASE	
dBase II	279
dBase III	372
R:Base 4000	289
Knowledgeman w/K pen & K graph	295
Powerbase	275
Friday	195
DB Plus	95
Quick Code & DUtil Pak	185
UTILITY	
Peter Norton Utility	55
Prokey	87
Sideways	45
COMMUNICATION	
Microstuf Crosstalk	115
Smartcom II	109
Transporter	205
PROFESSIONAL	
Desk Organizer	195
Harvard Project Manager	275
Compusoft Legal/Software—Call for info.	
Real Estate Analyser II	175
Visi Schedule	125
COMPILERS	
Cobol Compiler	485
Fortran Compiler	245
Lattice 'C' Compiler	325
Microsoft 'C' Compiler	325
Microsoft Pascal Compiler	215
Macro Assembler	65
Digital C Basic Compiler	375
Pascal MT and CPM186	255
FINANCIAL	
Home Accountant-Apple	49
Personal Investor	135
Accounting Plus GL, AP, AR, PR, INV Each	399
State of the Art GL, AP, AR, PR, INV Each	485
Peachtree GL, AR, AP Each	475
Think Tank	125
Data Cell II (Tax Preparer)	1125
WORD PROCESSING	
Bank Street Writer IBM	55
Edix/Wordix Each	129
Peach Text 5000	245
Pfs: File	84
Pfs: Report	79
Multimate	275
Volkswriter Deluxe	162
Word Perfect	275
Wordstar Pro w/Correctstar	299

NATIONAL SALES

MC-P APPLICATIONS INC.
1630 Oakland Road,
Suite A114
San Jose, CA 95131
U.S.A.
Telephone: (408) 293-3360
Telex: 821 396 MCPA UD

RETAIL OUTLETS

Pick 'N Pay Software
San Jose, CA
Telephone (408) 293-3360

Pick 'N Pay Software
Phoenix, AZ
Telephone (602) 285-1700

MC-P International Sales Offices

AUSTRALIA	02-929-8468
NEW ZEALAND	09-34545
ENGLAND	02357-2189
HOLLAND	020-268829

ORDER STATUS AND TECH. SUPPORT — CALL (408) 293-3360

PLEASE CALL FOR HARDWARE & SOFTWARE NOT LISTED THIS AD

INTERNATIONAL DEALER INQUIRIES WELCOMED

TERMS: All prices subject to change without notice. Payment by cashier's check/MO/bank transfer. Please allow approximately one week shipping delay for clearance of personal or company checks. California residents add sales tax. For non cash sales please add 3%

SHIPPING: Add $4 per item for UPS Surface, $8 for UPS Blue Label. For Monitors add $20 and Printers $25 for shipment within continental U.S.A

HARDWARE

COMPUTERS	
IBM PC 64K/1DD/Ctrl Cd	$1545
IBM PC/XT 128K	3495
IBM Portable	2195
Apple IIc	1145
Apple IIe 80 col & Mon.	1295
Macintosh w/Imagewriter Printer	2595
DISK DRIVES	
Teac Half Height	165
Tandon 100-2	195
HARD DISKS	
Tall Grass 12 Mgb	2245
Pegasus 10 Mgb (Internal)	1195
Iomega 10 Mgb	call
PRINTERS	
Epson FX100	695
IBM Parellel Printer Cable	29
LQ 1500	1145
NEC 3550	1675
Okidata 92P	409
Qume 1140 plus	1435
MONITORS	
Amdek 12" 310A	169
Amdek Color II RGB Hi-Res	399
Princeton RGB Hi-Res	485
IBM Monochrome	235
IBM color	565
MODEMS	
Smart Mod. 300 w/Smartcom	199
Smart Mod. 1200	495
Smart Mod. 1200B	429
J-Cat	99
Smart Cat 103	169
Smart Cat 103/212	425
HARDWARE & PERIPHERALS	
Megaplus 64K	265
Six Pac Plus 64K	265
Quadboard II	285
Orchid Blossom	255
64K Ram Chips	45
Techmar Graphics	525
Hercules Graphics	335
Plantronics	395
STB	335
Everix	call
Intel 80/87 Chip	175
Orange	94
Peach	64
Irma Board	895
Compuguard	call
Kraft Joysticks	35
TG Joysticks	35
Hayes Mach III Joysticks	39
PC Mouse w/Software	165
NETWORK	
Orchid PC Net	345
PC Net w/Blossom	525
COMMUNICATIONS	
AST 3780	635
AST 5251	545

CIRCLE 290 ON READER SERVICE CARD

Bank à la Modem

A Tempting Menu of HomeBanking Services from Bank of America

Bank of America brings an appealing menu of services to your personal computer called HomeBanking service.

With HomeBanking service and a Bank of America checking account, you can check your daily balance, review your checking statement records, transfer funds, and even send and receive messages. You can also make payments to more than *800* department stores, utilities, insurance companies, and other financial institutions *on-line* with HomeBanking service. Plus, you can predate your payments up to 30 days in advance. And our menu of services will be expanding even more! Bank à la modem with all these services for only $8.00* a month.

Sign up now for HomeBanking service, and we'll give you a special appetizer! You'll have a choice of rebates on **any or all** of the following:

$50 off *Apple® Modem 1200***
$30 off *Apple Modem 300***
$30 off *Dollars & Sense™ and Forecast™ for Apple personal computers*
$30 off *Dollars & Sense with Forecast for IBM and IBM compatible personal computers*
$20 off *PFS:®ACCESS for selected MS-DOS and the Apple IIc and IIe personal computers*
$20 off *PFS:®WRITE for selected MS-DOS and the Apple IIc and IIe personal computers.*

CIRCLE 118 ON READER SERVICE CARD

When you sign up for HomeBanking service, you'll receive your rebate package.

Best of all, Bank of America's advanced technology handles all the necessary interface, so HomeBanking service is compatible with any personal computer or terminal with communications capability.

Call **toll-free 1-800-652-1111** *from 8:00 AM to 5:00 PM (Pacific Time), Monday through Friday, for a taste of HomeBanking service, right on your own personal computer.*

Take advantage of our special offer from HomeBanking service today—and begin banking à la modem.

*Regular checking account charges still apply.
**Apple modems must be purchased from an authorized Apple dealer.

Apple is a registered trademark of Apple Computer, Inc.
Dollars & Sense and Forecast are trademarks of Monogram.
PFS: is a registered trademark of Software Publishing Corporation.
Bank of America NT & SA Member FDIC

Mail this coupon to:
Bank of America
HomeBanking Service Center
P.O. Box 306
Half Moon Bay, CA 94019

HomeBanking

Yes! I'd like to bank à la modem with HomeBanking service and receive my rebate package.

☐ I am already a Bank of America checking account customer. Please begin my HomeBanking service immediately. I understand charges will become applicable upon sign-up.

Signature _____

Checking Account Number _____
(Special restrictions apply to Cash Maximizer™ accounts.)

VERSATEL® Customer Number (last nine digits on your card) _____

☐ I am not yet a Bank of America checking account customer. Please send me all the information I need to open an account and sign up for HomeBanking service.

Name _____

Address _____

City _____ State _____ Zip _____

Phone (_____) _____ Best time to call _____

Act now! You must sign up for HomeBanking service between **October 15 and December 31, 1984** to qualify for the rebate offer. (**Note:** One rebate package per customer. To qualify for rebates you must receive the rebate package *prior* to your purchase(s). Purchase of hardware or software must be made between October 15, 1984 and March 15, 1985. Proof of purchase will be required.)

For additional information and an on-line demonstration of HomeBanking service, simply call **toll-free** from 8:00 AM to 5:00 PM (Pacific Time) Monday through Friday: **1-800-652-1111.**

BANK ON THE LEADER™

Bank of America

515

PRODUCT REVIEW

Forwarding Mail with InfoPost via E-COM

BY BARBARA KRASNOFF

InfoPost
InfoDesigns, Inc.
445 Enterprise Court
Bloomfield Hills, MI 48013
(313) 334-9790
(800) 445-INFO
List Price: $295
Requires: 128K, two 320K disk drives or hard disk, 300- or 1200-baud modem.

Once upon a time the U.S. Post Office tried to find a high-tech cure-all for the "Neither snow, nor rain...." bromide. They introduced E-COM (electronic computer originated mail) in 1982 to streamline the delivery of mail, especially large batches of correspondence. Using E-COM, a customer sends the text of a letter, and the addresses it should be sent to, over modem to a designated post office. The message is electronically typed, stuffed, and sent.

However, the system suffered certain deficiencies as a result of government controls and rigid operating rules. A 200-letter minimum was set for each batch of messages sent, and complex formatting guidelines made it difficult to edit and send the letters. By June 1984, the Board of Governors of the Postal Service decided to turn E-COM over to the private sector to generate more efficient handling. Now, several private firms are interested in leasing or buying the system from the Postal Service.

Software Support

But while E-COM was in its early months of operation, several software companies came up with communications packages to help customers cope with its specialized format. In spite of the changeover of E-COM to private hands, these software companies seem to be strongly supporting E-COM.

One of these designers, InfoDesigns, Inc., is betting that the new operators of E-COM will continue to be a strong market for electronic mail communications packages. "There's nothing different now that E-COM didn't provide 6 months ago," says president Richard Stahl, who recently released a package called *InfoPost*. He claims, "We have seen no negative results in sales," as a result of the June announcement.

InfoPost contains a simple word processor, an error checker (for problems in the formatting of the material), and a communications program that will send the information automatically to the appropriate post office. It also includes a program that keeps track of your available funding.

Three Ways

You can send messages three different ways using the E-COM system: via SAM (single address message), which sends a unique letter to one address; COT (common text message), which sends one message to different addresses; and TIM (text insertion message), which sends customized letters with variable information within the body of the message.

InfoPost's Document Writer word processor is a somewhat limited but easy-to-use program that works within very strict guidelines. You choose a series of commands such as APPEND, COPY, DELETE, and SAVE from the *Document Writer* menu by hitting a single letter (for example, L for LOAD, S for SAVE, etc). The program reacts to the commands instantly, without use of the Return key; so once a choice is made, you are pretty well committed.

Formatting commands are inserted into the text using the at sign (@) and an easily recognizable English language command; for example, @RETURN in front of an address specifies a return address, @SENDTO specifies the destination, and @FILE specifies a list of addresses that you can use as a separate file with whatever message is included.

The body of the text is limited to a 30-character width, and addresses can't be more than four lines in length. So if you're planning to send a letter to a company official with a title, address, and suite number, you may be out of luck. (If you don't want to use *Document Writer*, the manual gives specific instructions for using *WordStar* to prepare your message. However, the same space limitations apply.)

Once the body of the message and the necessary addresses have been registered with the software, you must then build an E-COM group file. This option checks a completed address and/or message file for format errors and inconsistencies.

The program will also tell you how many entries you have made in the file and what the cost of sending the message will be. If an error is found, the program identifies and displays it, along with an explanation of the problem.

Once the file is found to be satisfactory, you can transmit it via modem to the appropriate post office. Unfortunately, this utility has several small but irritating problems that subtract from the efficiency of the software. For example, if you are the owner of a Hayes Smartmodem, you should be able to "program" the software to automatically call the appropriate post office. However, *InfoPost* gives you 11 spaces in which to specify the phone number; if you have the type of phone lines in which you must first hit 9 to get an outside line, you're out of luck.

More Problems

Since I do have that type of phone system, I had to use the manual transmission setting with my Smartmodem. Here, I ran into more problems—and this time, it wasn't with the software, but with the manual itself.

Somehow I was left with the impression that, once connected to E-COM, I would receive the message//E-COM START and a request for my ID (in somewhat the same way that MCI *Mail* or the *Source* identifies itself when you connect). What I somehow missed (and wasted about three phone calls discovering) was that the user is responsible for typing in that initial START message.

As a matter of fact, I found the inability to change your mind in midstream to be a continuing problem in both *InfoPost* and E-COM. In *InfoPost*, there is not only the immediate commitment to any command chosen, but the fact that, once you have typed a line in the editing mode and have hit Return, you cannot correct any errors. You must save the text and go into either replace or insert mode. Meanwhile, E-COM itself is somewhat hostile to less-than-perfect typists: the E-COM system recognizes everything that is transmitted to it, including backspaces. Therefore, if you make any mistakes at all when sending your ID codes, or if you hit the Enter key rather than Control-C to signal completion, you may as well hang up—you won't be recognized as a valid customer. (According to a representative of E-COM, this isn't a problem for most users, since they first set up a utility to transmit the numbers automatically.)

As a test, I transmitted a TIM file with a return address, a short message, and three fictional destinations. Once I managed to get past the ID stage, my message and addresses transmitted fine, and the results of the test were mailed back to me. The only problem with the message itself was that it was almost to the left edge of the stationery; a representative of E-COM suggested that I indent future messages about eight spaces. However, while that could be correct with *WordStar*, it would not be possible with *InfoPost*'s word processor.

InfoPost is a fairly simple, basic software package that will probably come in handy for those who use the Postal Service's E-COM facility often. However, it would be much more useful if all those small, irritating, and avoidable problems were corrected. ■

And you thought we only ran 1-2-3.

Hercules™ is famous for being the only high resolution graphics card authorized by Lotus™ to run 1-2-3.™ Now we are the only graphics card authorized to run a couple of other programs you may have heard about —Symphony™ and Framework.™

When these hot new programs wanted hot graphics, they chose to support the undisputed leader, Hercules. When you've sold over 100,000 graphics cards, the world takes notice.

At Hercules, we believe that the most important feature in a graphics card is that it should run lots of software —with true full-screen, high resolution graphics on the IBM® PC Monochrome Display. So when you buy a Hercules Graphics Card, you can rest assured that it will run more graphics software than anyone else. Even on the new AT.™

Call **800 255-5550 Ext 400** for the name of the Hercules dealer nearest you. See why the company that made the first graphics cards for the IBM PC still makes the best.

Hercules.
We're strong on graphics.

Address: Hercules, 2550 Ninth St, Berkeley, CA 94710 Ph: 415 540-6000 Telex: 754063 **Features:** IBM Monochrome Display graphics resolution of 720 × 348; parallel printer port; full text mode software compatibility; free programming software; 2 year warranty. **Foreign distributors:** Compuserve/Canada; Reflex/U.K.; Computer 2000/W. Germany; Edisoft/France; Imagineering/Australia, Holland Info Products/Holland; DataTeam/Scandinavia **Trademarks/Owners:** Hercules/Hercules Computer Technology; Lotus, 1-2-3, Symphony/Lotus Development; Framework/Ashton-Tate; IBM, AT/International Business Machines.

CIRCLE 146 ON READER SERVICE CARD

Time Line Enters Decision Support Race

NOVATO, Calif.—Developers of decision support software have two common beliefs: They're convinced their product will launch businesses to new heights—and that their product is ultimately unique.

Time Line, a time-budgeting program recently available from Breakthrough Software, located here, is yet another voice in this chorus. *Time Line*, which tracks and schedules project resources and plans either forward or backward in time—up to 15 calendar years out, is the first in a planned series of easy-to-use, practical business programs, Breakthrough says.

The program requires 256K RAM and runs on the IBM PC, AT&T, and compatibles. It carries a $395 list price.

To run *Time Line*, a manager enters the various tasks to be performed by various personnel and how much time the tasks will take. With the entry of beginning and ending parameters, the program maps out time and personnel limits on a Gantt chart. As the project moves ahead, progress can be duly noted.

Breakthrough provides detailed help menus in *Time Line* because, according to company president William Lohse, a cofounder of MicroPro, their target group has neither the time nor the inclination to delve into detailed manuals.

"*Time Line* can easily be used without the manual," he adds. "It's for people who like to jump right into it."

Despite this claim, a novice user will not be able to run *Time Line* without the manual, which, incidentally, is written in short-story format with the tutorial commands set in boldface.

The program was written by Andrew Layman, who was working on it for several years prior to hooking up with Breakthrough. Breakthrough is located at 505 San Martin Dr., Novato, CA 94947, (415) 898-1919.

—Charles Bermant

Calendar of Events

DATE	EVENT	COMMENT	LOCATION	CONTACT
October 29-November 1	COMDEX/Europe	Hardware, software, and accessories.	RAI Congress and Exhibition Centre Amsterdam, The Netherlands	The Interface Group 300 First Ave. Needham, MA 02194 (800) 325-3330 (617) 449-6600
November 1-4	Bits, Bytes, and Books: The First Annual Computers and Publishing Conference	Workshops, seminars, and discussion of the computer book market.	Univerity of California La Jolla, CA	UCSD Extension University of California La Jolla, CA 92093 (618) 452-3430
November 1-4	Consumer Electronics and Computer Expo	Sales show featuring consumer electronic and computer products.	Nassau Coliseum Uniondale, NY	Expositions Inc. 33 Bell St. W. Babylon, NY 11704 (516) 293-5533
November 2-4	Regional Educational Software Informart	Seminars on educational software developments.	Penta Hotel New York, NY	National Educational Software Informarketing 225 E. 57th., 17H New York, NY 10022 (212) 688-8904
November 4-7	Eighth Annual Symposium on Computer Applications in Medical Care	Tutorials, demonstrations, and exhibits on computer applications in health care.	Washington Hilton Washington, DC	Office of CME George Washington University Medical Center 2300 K St., NW Washington, DC 20037 (202) 676-8928
November 11-14	The Information Nation: New Actors, New Factors	Presentations on technology information and trade trends.	The Sheraton Palace San Francisco, CA	Information Industry Association 316 Pennsylvania Ave., SE Washington, DC 20003 (202) 544-1969
November 14-18	COMDEX	Hardware, software, and accessories.	Las Vegas Convention Center Las Vegas, NV	The Interface Group 300 First Ave., Needham, MA 02194 (800) 325-3330 (617) 449-6600
December 4-6	Microcomputer Database Management Systems	Seminars on how to select and use a micro-DBMS.	Dupont Plaza Washington, DC	Software Institute of America 8 Windsor St. Andover, MA 01810 (617) 470-3880

Micro-to-mainframe:

Before you settle for a simplistic solution, ask a few serious questions.

Choosing a micro-to-mainframe communications system is no game.

So before you toy around with "easy" solutions, ask some serious questions.

Will this product support full IBM Terminal Emulation?

Make sure the system can emulate remote batch and interactive IBM terminal systems.

Does the company offer a variety of products?

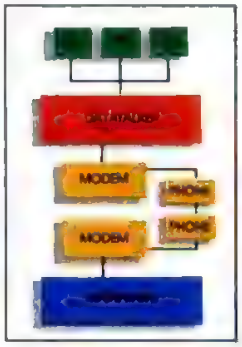
You should have your choice of stand-alone front-end processors, IBM PC or XT boards, or an OEM board. All ready to run on the most popular operating systems.

Can I get fast answers to my questions?

Insist on toll-free access to qualified service personnel before and *after* the sale.

What if I need a quick analysis of a problem?

Ask if the manufacturer has a Communications Test Center for product testing over public phone lines. And find out if the system has internal diagnostics.



Suppose something goes wrong with the unit?

The company should offer a 30 day money-back guarantee and a 12 month warranty that includes a free replacement unit.

What about future product development?

Make sure the products you're going to need soon will be available soon.

Who am I dealing with anyway?

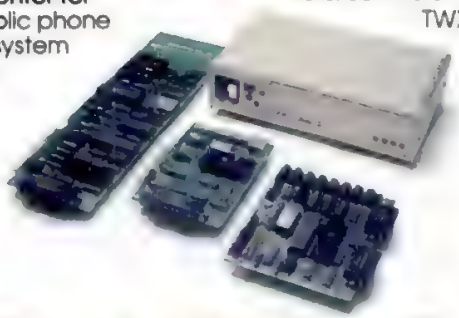
How long have they been in business? The longer, the better.

How much is all this going to cost?

Here's a point of reference: Our own DataTalker product line will give you all the capabilities and services just described for as little as $695. Complete. If you'd like to know more, contact our Marketing Support Group at 1-800-321-7785.

Providing Data Communications Solutions

Winterhalter, Incorporated
3853 Research Park Drive
P.O. Box 2180, Ann Arbor, MI 48106
313/662-2002 800-321-7785,
TWX 810-223-2423
TELEX 234-216



DataTalker™

By Winterhalter, Incorporated

Winterhalter, Incorporated has been providing data communications solutions to major manufacturers of microcomputers and word processors since 1978. Our DataTalker front-end processors and PC boards are used by companies around the world, from start-up manufacturers to the Fortune 1000.

NASDAQ SYMBOL WNTL

CIRCLE 185 ON READER SERVICE CARD

Now available for the IBM PCjr.

Computers Strike Below the Belt

Even those of us at *PC Magazine* sometimes feel that computers have gone too far. I recently received a piece of alarming junk mail that a computer had personalized by inserting Langdell-specific data into a form letter. The letter greeted me:

"Do me a favor, Mr. Langdell. Put on and wear the 2 pairs of Poplin Slacks I'm sending to your 1 Park Ave address next week. Wear them hard—anywhere around New York—to the office, golfing, boating."

Computer-generated advertisements are nothing new, but this letter made me wonder. How did a clothing company get my work address? Were two pairs of pants actually on their way to me? Such nerve! What made them so sure I'd want to buy those slacks? Don't they know there's a law that lets consumers keep unsolicited merchandise without paying the sender a penny?

Then a frightening thought struck me. If the computer was automatically mailing out pants, how did it know my waist size? Did it tap into a secret, nationwide database of personal measurements? And how was my waist size recorded in the first place? At night, while I slept?

And how current is that database, anyway? Does it know I added a few inches to my beltline last year, or that I've recently started to exercise?

After seething with paranoid fantasies about Big Brother's latest triumph, I breathed a sigh of relief when I read the letter's last page:

"Now—so I can send your new Poplin Slacks in the size and colors you want, won't you tell me your choices on the handy postage-paid card enclosed."

When the computer-generated missive finally quelled my Orwellian fears, I was not only relieved, I felt grateful. I quickly filled out the card and ordered those lightweight pants. Only later did I realize my folly: I had given them exactly what they wanted. Now the computer knows about my 34-inch waist!

—James Langdell

Multi-User Board First AT Product

NEW YORK—Three months before IBM's scheduled introduction of the hardware and DOS 3.1 operating system that will give the PC AT multi-user capabilities, an Atlanta retailing and manufacturing firm made its own system available.

Computone Systems's AT-VANTAGE immediately upgrades the AT into a multi-user system with up to nine workstations.

"The AT was introduced as a personal computer," Tim Sullivan, Computone's business systems vice-president said. "We have turned it into a true business product."

The AT-VANTAGE system, which uses one board to accommodate multiple machines, has been in the works for almost a year. Due to the fortuitous timing of IBM's AT release, AT-VANTAGE is the first product to be introduced specifically for the new upper-end PC.

While Computone declined to disclose AT-VANTAGE's list price, company president Jay Rosovsky said that three AT workstations equipped with the new board would "run in the neighborhood of $16,000 to $18,000."

Computone is now involved in retail sales as well as manufacturing; among its holdings is the upstate New York Computer Room chain. A recent company report boasted that 80 percent of its revenues have come from products and services developed in the last 18 months.

Rosovsky conceded that the new board competes against Computone's current hardware line, specifically its own multistation computer system. Computone Systems, Inc., can be contacted at One Dunwoody Park, Atlanta, GA 30338, (404) 393-3010.

Next in AT Line

Following Computone's announcement, MAI/Basic Four Business Products (P.O. Box 8350, Albuquerque, NM 87198, (505) 266-5811 and Mountain Computer Inc. (300 El Pueblo Road, Scotts Valley, CA 95066, (408) 438-6650) also introduced AT accessories.

Basic Four's two upgrade kits are designed for use on the AT with Basic Four accounting software. Part of this update is an individual user file-locking system, prohibiting simultaneous changes to a record.

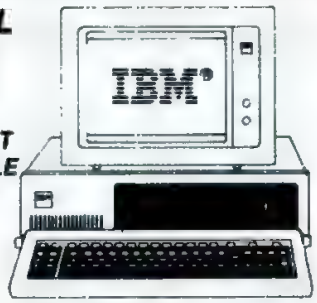
The list of new AT products is small but growing rapidly. One of the most interesting is a tape backup system for the AT, developed by Mountain Computer, for use with either the floppy or the hard disk. The new system can either save several smaller programs on one tape or use multiple tapes for hard disk backup.

—Charles Bermant

COMPUTER HUT™

COMPARE OUR SERVICE & PRICE!

SPECIAL OF THE MONTH



IBM-PC & XT & PORTABLE CALL FOR PRICE

DISK DRIVES

Tandon TM100-2 DS/DD	$185
MATSUSHITA JA 551	169
TEAC FD-55B Slimline	179
SHUGART SA-455 half-high	CALL
MAYNARD WS1/WS2/WS3	CALL
SYSGEN — Hard disk & Tape	CALL

MAYNARD ELECTRONICS

Floppy Disk Controller	$129
FDC w/Par. Port or Ser Port	CALL
SANDSTAR SERIES	CALL

QUADRAM

Quadboard expand to 384K	CALL
Quadcolor	CALL

AST RESEARCH

MegaPlus II 4-Funct 64K + s/w	$279
6-Pack 5-Funct 64K + s/w	$279
I/O Plus	$129
MonoGraphPlus	CALL
STB	CALL

MICROLOG

Baby Blue	$359
Baby Blue II 64K	$499

GRAPHICS BOARDS

TECMAR

Graphics 720 × 400 16 colors	$499

HERCULES

Hi Res Mono Graphics 720 × 348	$335
Color Graphics w/Par Port	CALL

PGC PRODUCTS

COLORPLUS 640 × 200, 16-Color w/Par Port + s/w	$389

PARADISE

Multidisplay	$349
EVEREX Graphics Edge	CALL

MODEMS

Hayes

Smartmodem 1200	$489
Smartmodem 1200B	$419
NOVATION, ANCHOR	CALL

PRINTERS

EPSON

FX80 ..... CALL FX100 ... CALL

brother

HR-15 Par .... $399 Ser $399
HR-25 ..... $649 HR-35 ... CALL

DYNAX

DX-15 Par .... $399 Ser $399

C-ITOH

STARWRITER A-10	CALL
STARWRITER F-10 P	$1095

star MICRONICS

Gemini 10X ... $289 15X ... $399
Radix ..... CALL

OKIDATA

84P ..... CALL 84S ..... CALL
92P ..... BEST 92S ..... BEST
93P .... PRICES 93S .... PRICES

NEC

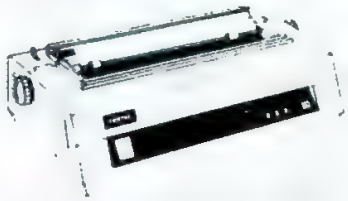
3510 ..... $1375 7730 ..... $1895
3530 ..... $1375 2030 ..... $749
3550 ..... $1675 2050 ..... $895

TOSHIBA

P1351 ..... $1499
P1340 ..... $839

DAISYWRITER

2000 w/48K Buffer $995
IDS Prism ..... CALL



ANY PRODUCT NOT LISTED? CALL

COMPUTERS

COLUMBIA DATA PRODUCTS, INC	CALL
TAVA PC	CALL
COMPAQ	CALL

MONITORS

AMDEK

Video 300G ... $145 300A $155
Video 310A $179

PGS

HX12 Hi Res RGB monitor .... BEST
MAX-12 Hi Res Mono. PRICES
SR-12 Super Hi Res RGB

SOFTWARE FOR IBM-PC

Volkswriter	$135	VW delux	$199
R:base 4000			$319
Harvard Proj. Mgr.			$279
Crosstalk			$129
PFS: File			$119
PFS: Graph			$109
PFS: Report			$109
PFS: Proof			$89
FLASH COM			CALL
LOTUS			CALL
Word Perfect	$279	WordStar	CALL
dBase III	$499		
Multiplan	$135	Multimate	$299
Microsoft Word			$269
Framework			CALL

AND LOTS MORE

CANADIAN COMPUTER HUT

AUTHORIZED DEALER

MICROCONTEXT INC.
5253 Ave Du Parc
Montreal Que H2V4P2.
(514) 279-5114

Published Prices are for U.S.A. Only
Please call for Canadian Prices

CIRCLE 115 ON READER SERVICE CARD

EAST COAST

COMPUTER HUT
OF NEW ENGLAND INC.
101 Elm St. Nashua, NH 03060
(603) 889-0666
For Orders Only — (800) 525 5012

★

MID-WEST

COMPUTER HUT INC.
524 S. Hunter
Wichita, Kansas 67207
(316) 681-2111
For Orders Only — (800) 572 3333

All products usually in stock for immediate shipment and carry full manufacturers' warranty. Price subject to change — this ad prepared two months in advance. You get the lowest price. We honor personal checks — allow 10 days to clear. COD up to $300 add 2%. Visa, MasterCard add 2%. For shipping & insurance add 2% or $5.00 min. for small items and $10 min for monitors, printers, etc. We accept company checks and P.O.'s from Fortune 1000 Companies.

IBM is a trademark of IBM Corp.

Return authorization and order status call information line

Fred Collopy and Don Huesman

A Philadelphia experiment leads to more organized desks and dreams of a Jaguar

BY CHARLES BERMANT

PHILADELPHIA—"It was like trying to buy a gun."

Fred Collopy is recalling 1972, when he strolled into a Wang district office, in long hair and jeans, and attempted to purchase a Wang 600. He pulled out a $4,500 certified check, but the salesman said they didn't sell to "people"—a company purchase order was required. Finally the sale was made. Collopy, then a financial analyst working with the state of Ohio, was well on his way to computer heaven.

Twelve years later, 36-year-old Collopy is lord of his own castle. As producer of the *Desk Organizer* program, he and his staff of six occupy seven rooms on the top floor of an imposing West Philadelphia structure, complete with stone turrets. But the relative calm of his Conceptual Instruments could be short-lived; *Desk Organizer* is the subject of a major market thrust by Warner Communications' software division.

Collopy is the first to delegate the credit and insist he is not a typical company president. Would a corporate giant take the time out to pick up an interviewer at the train station? He shares available limelight with Don Huesman, 33, coauthor of *Desk Organizer*. The two, Collopy maintains, share a yin and yang relationship, but he can't say who is which.

"We view programming as collaborative," Collopy says. "It's more like making a film than writing a book. The six of us constitute the development crew—everyone crosses boundaries. No one is called programmer, although everyone does some programming. This is one of the things that led us to Warner. They appreciated that vision, which is not so different from what goes into films or records."

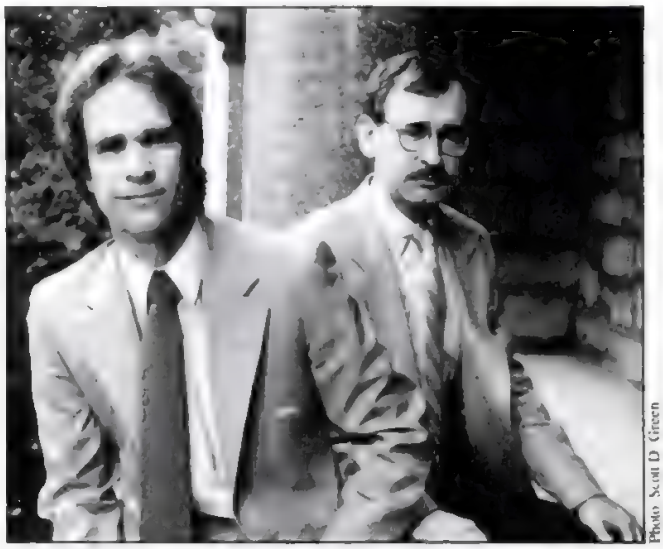


Photo: Scott D. Green

Fred Collopy and Don Huesman

The two partners met while attending Kentucky's Thomas More College during the 1960s. Huesman subsequently became involved in public interest and alternative energy work, while Collopy ended up as an instructor in Wharton's School of Decision Sciences. Collopy recruited his old friend when he founded the new company because "we needed an organizer, someone smart and quick who was not enamored of computing."

At one point Collopy was planning to be a monk, though he was never "finished, confirmed, and packaged." One employee, when asked how this background may have affected him, jests that Collopy "gets a little preachy sometimes."

"There is not a whole lot of difference between a medieval fellow bending over a manuscript with a quill pen and the modern counterpart, hunched over a CRT and a keyboard at 3 a.m.," says Huesman.

When asked how his background has influenced him, Collopy only says "I don't swear as much as these other m——s."

Not a Company

Collopy and Huesman say they don't want to be "a software company," no matter how many copies of *Desk Organizer* they sell. Instead, they call themselves "conceptual producers" who will create "new consumer perceptions of technology."

"Our product stands out because it captures something about the way people really work. People buying a personal computer are looking for it to take away some of the things that clutter up their desks. We developed a way to tuck information away, imitating a mechanism that people already knew. We then layered the mechanism and made it look familiar."

Joking about their coming success, Collopy and Huesman claim they "only want to make a decent living without making bombs." Conceptual Instruments is still a place where customers seeking support will often end up talking to the company president.

"Right now, no lines are lit up," Huesman said. "This tells you that not a lot of people are having trouble with the programs."

The first version of *Desk Organizer* was developed on cassette for the Apple II but never released. Various other mutations of the program followed, and Conceptual Instruments soon began to concentrate on the PC market.

At the same time, Warner was looking for a good piece of software it could rally behind. All was finalized at COMDEX, Winter 1983. The *Desk Organizer* MS-DOS version is expected to hit the market this month (the current edition uses its own operating system).

In the Future

Although they affect atypicality, Collopy and Huesman are predictably secretive when it comes to future plans. They do say they will not pursue "traditional well-honed software categories." One idea is to develop a "motion-picture version of analysis, in the same way that a spreadsheet is a photograph." "There is a need for this," says Collopy, "and the math exists."

Huesman, for his part, has seen his lifestyle change in the past few years. "I used to spend all my time sitting next to a natural lake. Now I get to talk to 600 dealers over the next few days," he says. "And I used to be interested in world peace, harmony, and actualization. Now I'm after a new Jaguar with a good sound system and a briefcase full of $20 bills." ■

Ferocious FORTRAN.

Microsoft® FORTRAN crunches numbers with a vengeance!

It combines fast and efficient native code compilation with built-in 8087 coprocessor support. The result? Mini and mainframe performance from your MS™-DOS micro.

Based on the '77 standard, Microsoft FORTRAN supports extensive statements and data types—including complex numbers and IEEE single and double-precision floating point accuracy.

Support for large arrays (greater than 64K bytes), separate module compilation, and overlays, allow you to create very large programs—up to one megabyte, with access to more than 65 thousand records in a file as large as four gigabytes.

MICROSOFT.
The High Performance Software

How do programmers feel about Microsoft FORTRAN?

"The first FORTRAN compiler that takes advantage of the full addressing capability of the 8088 and the power of the 8087."
—Jack Wilschke, *Softalk*

"We decided to use the Microsoft FORTRAN Compiler for its INTEGER* 4 capability and the flexibility of its 8087 implementation."
—Charlie Huizena & Chip Barnaky, *PC World*

Call 800-426-9400 to order the ferocious FORTRAN. $350.*

In Washington State, call 206-828-8088. Ask for operator C6, who will rush you your order, send you more information, or give you the name of your nearest dealer to see Microsoft FORTRAN in action.

*Price exclusive of handling and Washington State sales tax
Microsoft is a registered trademark and MS is a trademark of Microsoft Corporation

An Industry First in Word Processing Software:

WordPlus-PC™ featuring the BOSS™. Word processing so smart it can even spell 100,000* words.

Meet the BOSS. WordPlus-PC's incredible new Built-in On-line Spelling System.

WORD PROCESSING AND SPELLING COMBINED:

WordPlus-PC featuring the "BOSS" is a whole new technology in word processing software. Finally, the most powerful word processing capabilities have been combined with a built-in electronic spelling system which not only *checks your spelling* but also *corrects your spelling*.

The "BOSS", an acronym for Built-in On-line Spelling System, eliminates embarrassing spelling errors in your letters and stops time consuming trips to the dictionary.

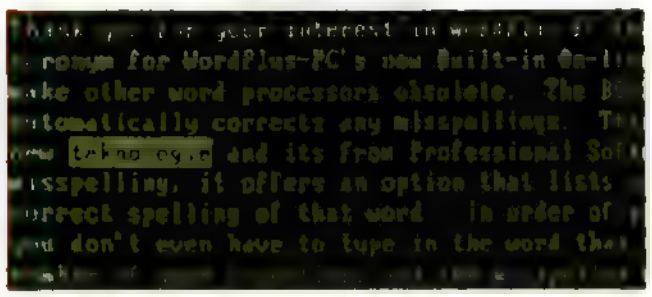
But WordPlus-PC featuring The "BOSS" will do far more than just check and correct your spelling. It's been designed to be exceptionally easy to use and yet contain all the powerful features you expect and more. Like built-in mail merge for personalized form letters, invoice generation and the ability to merge information created by most other popular programs such as 1-2-3™ and dBASE II.™ And if you have a question, just press the HELP key to get back on track.

You can also print bar graphs and other charts,** easily move columns, scroll horizontally, execute global search and replace, boilerplate text, and even print proportionally spaced on selected printers. And WordPlus-PC is compatible with virtually all popular letter-quality and dot matrix printers.

*With 90,000+ word standard dictionary and ability for a user to add over 10,000 "custom" words.

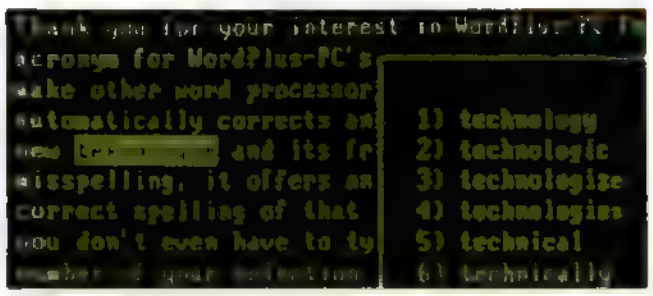
HERE'S HOW THE BOSS WORKS FOR YOU:

IT CHECKS



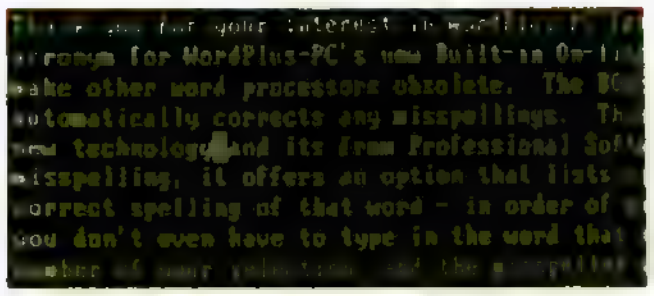
At the touch of a button, virtually anytime during typing or after the creation of a document, The "BOSS" locates and *highlights misspelled words* on your screen. The "BOSS" can even check the spelling of a word directly after it's been typed in.

IT SUGGESTS



When a word is misspelled, the user can ask The "BOSS" for suggestions as to how to correctly spell the word. With only one keystroke, The "BOSS" will display, in a dynamic on-screen window, up to eight *spelling suggestions in the order of probable phonetic correctness.*

IT CORRECTS



And The "BOSS" *Auto Correct* feature enables users to "fix" these misspelled words directly in text with a single keystroke. The "BOSS" is a total spelling system that Checks, Suggests, and Corrects your Spelling. All built-in.

THE TOTAL WORD PROCESSING SOLUTION — PLUS ALL THE HELP YOU'LL NEED.

With over 70,000 word processors in use worldwide, Professional Software, Inc. has designed WordPlus-PC to contain all the powerful features you expect — and to be the easiest word processor to use anywhere. But there will always be questions. That's why Professional Software has an entire bank of Nation-wide TOLL FREE customer HELP lines to support our registered users. This service is available at No Charge during the 90 days following the receipt of your registered users card.

Demand to see the BOSS in person
Visit your local professional computer dealer or call us toll free for the dealer nearest you. Once you witness the BOSS in action, you'll see that all other word processors have become totally obsolete.

Demand to see the "BOSS" today! Call us toll free, 1-800-343-4074.

Professional Software, Inc.

51 Fremont Street, Needham, MA 02194 Telephone (617) 444-5224 Telex 951579
Now Available for IBM-PC and Compatibles, DEC Rainbow, TI Professional, and Victor 9000.
Dealer, distributor, OEM manufacturer, and international inquiries are invited.

WordPlus-PC and The "BOSS" are trademarks of Professional Software, Inc.
1-2-3 is a trademark of Lotus Development Corp., dBASE II is a trademark of Ashton-Tate.
Specifications are subject to change without notice.

WordPlus-PC was designed and written by Andres Escallon.
**With IBM dot matrix and Diablo 630 ECS printer, bar graphs and other charts can be printed inside text.

CIRCLE 374 ON READER SERVICE CARD

Blazing BASIC.

Who said BASIC had to be slow?

Microsoft® BASIC Compiler lets you create MS™-DOS programs that are so fast users will never know they were written in BASIC.

The compiler produces fast, efficient native code. The result? Three to ten times faster operation than the same interpreted program. Even faster for programs that make maximum use of integers.

But it's not only fast in execution, it's fast for development. It's the one BASIC compiler designed to work best with our BASIC interpreter—the de facto industry standard. Together, they let you develop and debug your programs interactively using the interpreter, then compile for speed.

MICROSOFT®
The High Performance Software

And like all Microsoft languages, the standard linking interface makes it easy to combine assembly language subroutines.

Microsoft BASIC Compiler is just one reason Microsoft is your best source for high performance languages for 8088/86 based micros.

Call 800-426-9400 to order the blazing BASIC compiler. $395.*

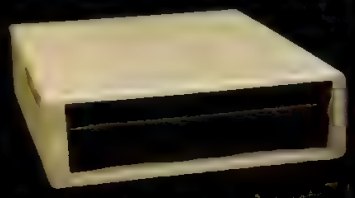
In Washington State, call 206-828-8088. Ask for operator E5, who will rush you your order, send you more information, or give you the name of your nearest dealer to see Microsoft BASIC in action.

*Price exclusive of handling and Washington State sales tax.
Microsoft is a registered trademark and MS is a trademark of Microsoft Corporation

THE BRIEFCASE DATA BASE.

CARTRIDGE DATA MANAGEMENT COMES OF AGE.

Today's business microcomputers have generated an information explosion that today's data storage devices—including the highly-touted, high-capacity Winchesters—have been ill-prepared to contain.



With one notable exception. The Bernoulli Box™ from IOMEGA. With its removable 10 megabyte cartridges and its proprietary flexible disk technology, The Bernoulli Box delivers unparalleled data base dynamics.

And that, more and more, is what your business needs today. Not centralized, monolithic banks of information, but data bases defined by job function and software application. Data bases that give people the versatility to work more productively.

But there is more. More performance and reliability. Transfer rates and access times faster than most Winchesters. No head crashes ever. And cost per megabyte that Winchesters cannot touch.

The Bernoulli Box's cartridge capacity, portability, and absolute interchangeability give your business more options. You can easily build primary data bases. You can package individualized data bases, software and all—for payroll, accounting, marketing—in convenient, dedicated cartridges. You can secure them quickly and economically in backup. And you can pack all of the data into a briefcase, an interoffice envelope, or even a file drawer.

The Bernoulli Box. For the IBM PC, XT, most compatibles and the TI Professional. **For the dealer nearest you, call 1-800-556-1234 ext. 215. In California call 1-800-441-2345 ext. 215.**

IOMEGA

IOMEGA Corporation
1821 West 4000 South
Roy, Utah 84067

See us at Comdex Fall
Booth #4958

THE BERNOULLI BOX™

CIRCLE 202 ON READER SERVICE CARD

Get Your Hands On Our Hands-On Analysis

Introducing Data Decisions™ MICROCOMPUTERS

An **ALL-NEW** information service for the corporate micro buyer that features

Hands-On-Testing

of Micro Software

by Experts in Data Decisions™ OWN LABS

Ask for a trial review of MICROCOMPUTERS and let Data Decisions do your software testing for you. You'll get the results of hundreds of hands-on tests **done under consistent, controlled conditions** by our team of micro experts . . . You'll find out how competing packages measure up against each other and what you can expect when you bring them in-house.

And that's just the beginning! Along with everything you need to know about spreadsheets . . . graphics . . . word processors . . . and other software products—you also get the latest word on business microcomputer systems . . . expansion/extension cards . . . communications products . . . peripherals—all the products and technologies you need to know about to grow.

MICROCOMPUTERS comes to you in three monthly updated loose-leaf volumes that are **consistently formatted** for easy product comparisons . . . and for finding the facts you need FAST.

Whether you're looking at LANs, PC compatibles, printers for micros, or the new integrated software packages, Data Decisions MICROCOMPUTERS supports you every step of the way. We have:

- **Hands-on evaluations** of software products by micro experts.
- **Rating charts** that let you compare how competing packages measure up in actual use.
- **In-depth analyses** that highlight strengths and limitations of mainstream products.
- All the **pricing** and **spec's** you need for feasibility studies and budgets.
- **Technology reports** that fill you in on issues and trends.
- **Unlimited free telephone consulting** by micro experts whose only job is to answer your questions.
- **Broadbased surveys . . . monthly newsletters . . . complete vendor directory . . . MORE.**

A 1-year subscription to Data Decisions MICROCOMPUTERS costs only $700. You get all this information and analysis for less than it would cost you to hire a consultant to test just one product!

But don't take our word for it . . .

SEE FOR YOURSELF!

Examine MICROCOMPUTERS at your leisure in your own office before you buy. Just fill in the coupon and mail it today. You'll receive a no-purchase-obligation TRIAL REVIEW.

And as an added bonus . . . just for taking a trial review of MICROCOMPUTERS, we'll also send you a free copy of

Business Communication Networks—
Putting It All Together

This special information-packed technology report shows you how to build a user network—from policy planning . . . to the selection and integration of products . . . to network management and control. It regularly sells for $39.00. . . . But it's yours to keep ABSOLUTELY FREE—Just for agreeing to review MICROCOMPUTERS . . . So fill in the coupon TODAY!

CIRCLE 140 ON READER SERVICE CARD

Data Decisions™ 20 Brace Road/Cherry Hill, NJ 08034/609-429-7100

We do the hands-on testing for you

☐ C5 Yes, please send me my TRIAL REVIEW of MICROCOMPUTERS. I understand that I'm under no obligation to purchase anything and that I may keep the free report even if I don't become a subscriber.

☐ Y4 Although your offer is completely risk-free, I'm still not sure. Please provide more information.

Data Decisions™ 20 Brace Road/Cherry Hill, NJ 08034/609-429-7100

Name _____

Title _____

Company _____

Address _____

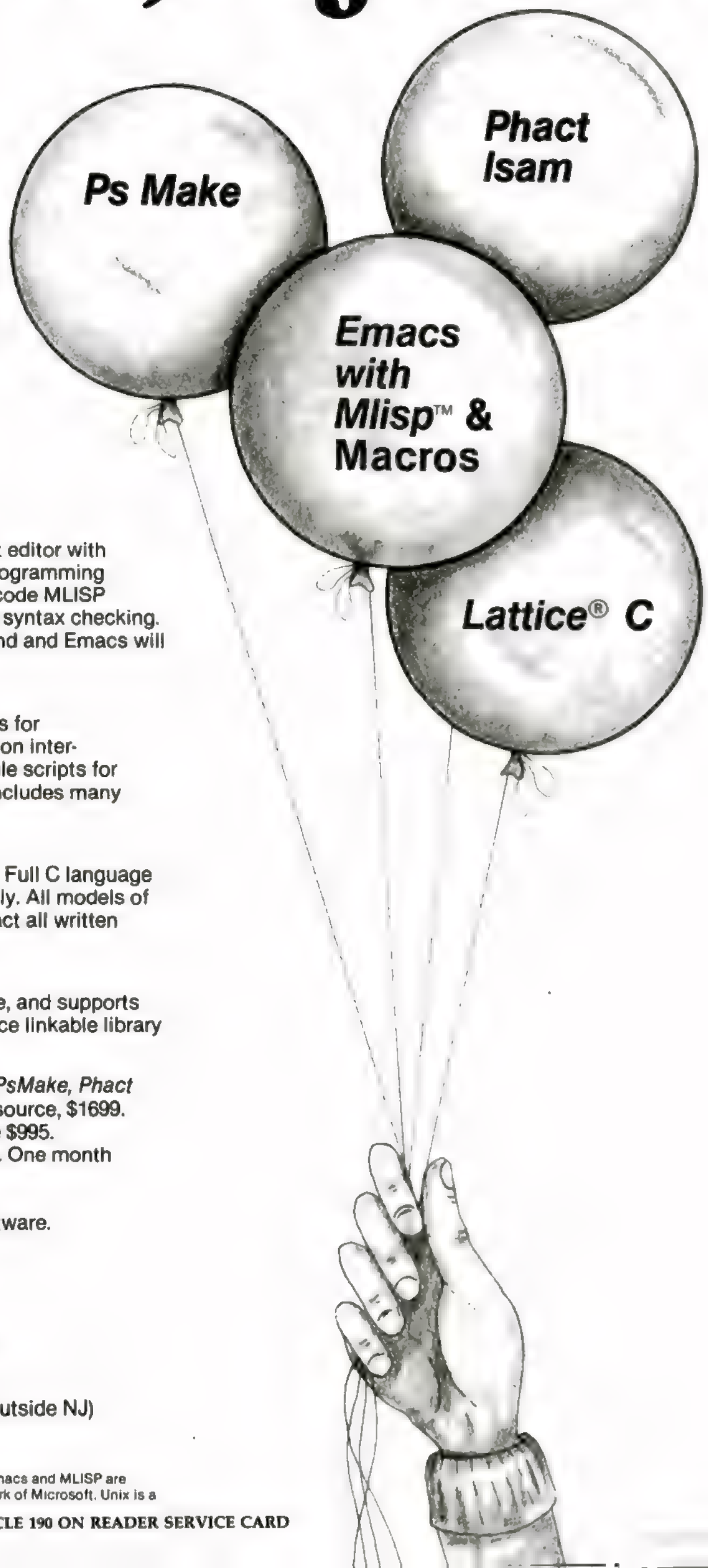
City _____ State _____ Zip _____

Phone (_____) _____
Area Code

A107

Hackers, rejoice!

Finally, a programmable multi-window editor for MS-DOS.™



EMACS™

UniPress EMACS
famed Gosling version. Multi-window, text editor with extensibility through the built-in MLISP programming language and macros. Dozens of source code MLISP functions; including C, Pascal and MLISP syntax checking. Run Lattice C or PsMake in the background and Emacs will point to any errors.

PsMake
UNIX style 'make' utility, includes facilities for automatically rebuilding programs based on inter-dependencies of the modules. Includes rule scripts for many popular MS-DOS languages. Also includes many UNIX style tools (ls, cat, touch, etc).

Lattice C
'the' C compiler for the serious developer. Full C language producing the best code for the 8086 family. All models of 8086 supported. Emacs, PsMake, and Phact all written using Lattice.

Phact Isam
multi-key ISAM for MS-DOS. Uses b+ tree, and supports variable length records. Includes full Lattice linkable library and high-level functions.

FULL SYSTEM *(includes Emacs (object), PsMake, Phact Isam & Lattice C)* — $1099, with EMACS source, $1699.
STANDALONE: EMACS $375, with source $995.
Lattice $425. PHACT $250. PSMAKE $129. One month EMACS trial $75.

UniPress is a major publisher of Unix Software.
Call or write for more information.

UniPress Software, Inc.

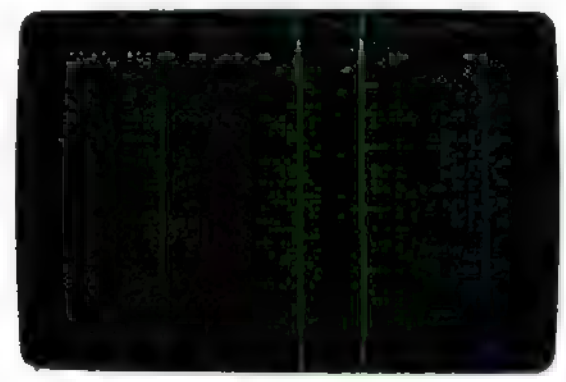
2025 Lincoln Highway, Edison, NJ 08817
201-985-8000 • Order Desk: 800-222-0550 (outside NJ)
Telex: 709418 • Mastercard and Visa

Lattice is a registered trademark of Lattice, Inc. UniPress Emacs and MLISP are trademarks of UniPress Software, Inc. MS-DOS is a trademark of Microsoft. Unix is a trademark of Bell Laboratories.

CIRCLE 190 ON READER SERVICE CARD

MICRO CAP and MICRO LOGIC put your engineers on line... not in line.

"Typical MICROCAP Transient Analysis"



"Typical MICROLOGIC Diagram"

How many long unproductive hours have you spent "in line" for your simulation? Well, no more. MICROCAP and MICROLOGIC can put you on line by turning your PC into a productive and cost-effective engineering workstation.

Both of these sophisticated engineering tools provide you with quick and efficient solutions to your simulation problems. And here's how.

MICROCAP: Your Analog Solution

MICROCAP is an interactive analog circuit drawing and simulation system. It allows you to sketch a circuit diagram right on the CRT screen, then run an AC, DC, or Transient analysis. While providing you with libraries for defined models of bipolar and MOS devices, Opamps, transformers, diodes, and much more, MICROCAP also includes features not even found in SPICE.

MICROCAP II lets you be even more productive. As an advanced version, it employs sparse matrix techniques for faster simulation speed and larger networks. In addition, you get even more advanced device models, worst case capabilities, temperature stepping, Fourier analysis, and macro capability.

MICROLOGIC: Your Digital Solution

MICROLOGIC provides you with a similar interactive drawing and analysis environment for digital work. Using standard PC hardware, you can create logic diagrams of up to 9 pages with each containing up to 200 gates. The system automatically creates the netlist required for a timing simulation and will handle networks of up to 1800 gates. It provides you with libraries for 36 user-defined basic gate types, 36 data channels of 256 bits each, 10 user-defined clock waveforms, and up to 50 macros in each network. MICROLOGIC produces high-resolution timing diagrams showing selected waveforms and associated delays, glitches, and spikes—just like the real thing.

CIRCLE 497 ON READER SERVICE CARD

Reviewers Love These Solutions

Regarding MICROCAP . . . "A highly recommended analog design program" (PC Tech Journal 3/84). "A valuable tool for circuit designers" (Personal Software Magazine 11/83).

Regarding MICROLOGIC . . . "An efficient design system that does what it is supposed to do at a reasonable price" (Byte 4/84).

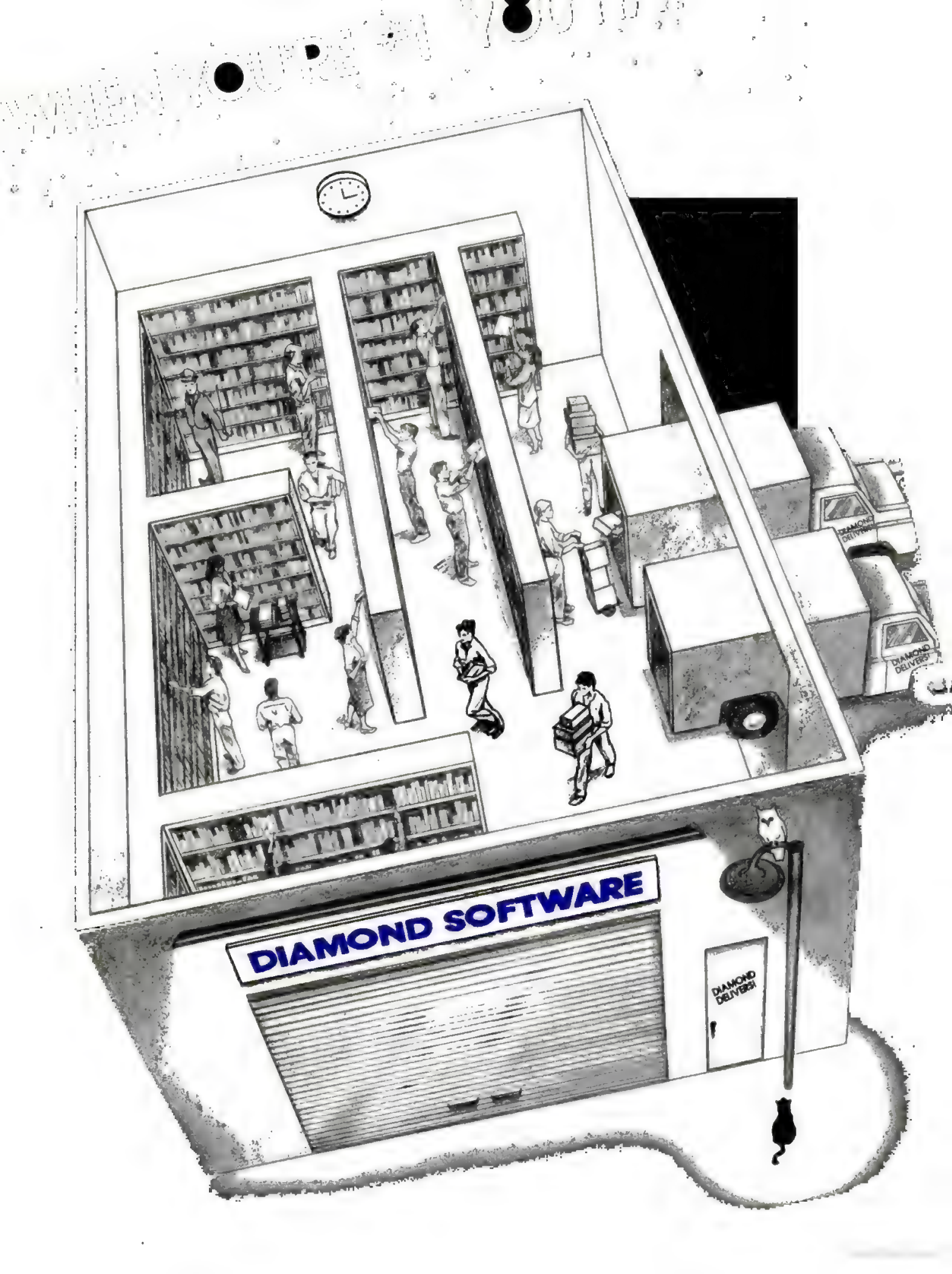
MICROCAP and MICROLOGIC are available for the Apple II (64k), IBM PC (128k), and HP-150 computers and priced at $475 and $450 respectively. Demo versions are available for $75.

MICROCAP II is available for the Macintosh, IBM PC (256k), and HP-150 systems and is priced at $895. Demo versions are available for $100.

Demo prices are credited to the purchase price of the actual system.

Now, to get on line, call or write today!

Spectrum Software
1021 S. Wolfe Road, Dept. F
Sunnyvale, CA 94087
(408) 738-4387


DIAMOND SOFTWARE
DIAMOND DELIVERY
DIAMOND DELIVERY
DIAMOND DELIVERY

WORK EVEN HARDER TO STAY THERE

DIAMOND DELIVERS!

The Total Solution
Full Service • Full Support
Low, Low Prices

This Month's Packaged Specials

Wordstar Pro Pack/ Lotus 123	$559
Wordstar Pro Pack/ Lotus 123/dBase III	$959
Hayes 1200/Crosstalk	$589
Wordstar/Mailmerge/ Correctstar/Star Index	$269
Multimate/Symphony	$709
AST 6 Pack 384K/ Symphony	$959
Wordstar Pro Pack Plus w/ Telmerge/Mailing List	$369
Easywriter II/Speller II/ Mailer II	$195

dBase III	$call
Volkswriter Dlx	$179
Framework	$call
Wordstar	$ 199
Lotus 123	$ call
Multimate	$289
R:Base 4000	$309
Multiplan	$ 129
Symphony	$ call

	LIST	SALE
Alpha Software*		
APPLE-IBM CONNECTION	$250	$139
DATA BASE MANAGER II	$295	$call
ELECTRIC DESK	$345	$219
Ashton Tate*		
dBASE II	$495	$299
FRIDAY	$295	$159
Condor*		
CONDOR 3	$550	$319
Microsoft*		
CROSSTALK XVI	$195	$105
Digital Research*		
PASCAL MT + 86	$400	$249
CONCURRENT PC DOS	$350	$call
CONCURRENT CP/M 86	$350	$229
C BASIC 86	$200	$135
PERSONAL BASIC	$150	$109
CP/M 86	$ 60	$ 39
ACCESS MGR	$400	$249
DISPLAY MGR	$500	$329
DR LOGO	$ 95	$ 69
PC DOS LANGUAGES		$call
Dow Jones*		
MARKET ANALYZER	$350	$239
MARKET MANAGER	$300	$209
Financial*		
FINANCIER II	$195	$119
TAX SERIES	$150	$109
Fox & Geller*		
QUICKCODE	$295	$179
dGRAPH	$295	$179
dUTIL	$ 99	$ 59
GMS Systems*		
POWERBASE	$395	$call

	LIST	SALE
Harvard Software*		
HARVARD PROJECT MANAGER	$395	$279
Informatics Unlimited*		
EASYSPELLER II	$100	$ 59
EASYMAILER	$100	$ 59
GENERAL LEDGER	$595	$call
ACCOUNTS PAYABLE	$595	$call
ACCOUNTS RECEIVABLE	$595	$call
INVENTORY CONTROL	$595	$call
PAYROLL	$745	$call
Lattice*		
LATTICE C COMPILER	$595	$319
PANEL	$350	$219
HALO	$200	$125
Mice Data Base*		
KNOWLEDGEMAN	$500	$319
Micropro*		
MAILMERGE	$250	$129
CORRECTSTAR	$100	$ 99
PLANSTAR	$495	$309
STARBURST	$195	$ 99
SUPERSORT II	$200	$ 99
INFOSTAR/STARBURST	$595	$299
TELMERGE	$145	$ 89
CHARTSTAR	$395	$209
PRO OPTION PACK	$345	$179
Microsoft*		
MOUSE	$195	$139
WORD/MAILMERGE	$375	$249
WORD W/MOUSE	$475	$309
MULTITOOL FINANCIAL	$100	$ 69
MULTITOOL BUDGET	$100	$ 99
PASCAL COMPILER	$300	$209
FORTRAN	$350	$239
C COMPILER	$500	$339
CHART	$250	$169
PROJECT	$250	$169

	LIST	SALE
Monogram*		
DOLLARS & SENSE	$165	$109
Professional Software*		
WORD PLUS W/BOSS	$495	$299
Microrim*		
CLOUT	$195	$129
EXTENDED REPORT WRITER	$150	$ 95
Research*		
PROKEY	$129	$ 89
Software Publishing*		
PFS REPORT	$125	$ 85
PFS FILE	$140	$ 95
PFS GRAPH	$140	$ 95
PFS WRITE	$140	$ 95
Sorcim*		
SUPERCALC 3	$395	$219
SUPERWRITER	$295	$159
Starpath Software*		
WARNER DESK ORGANIZER	$195	$179
AST Research*		
6 PAK PLUS-64K	$395	$269
ALL OTHER AST PRODUCTS		$call
Hayes*		
SMARTMODEM 1200	$699	$489
SMARTMODEM 1200B	$599	$419
Quadram*		
QUADLINK	$680	$479
QUADCOLOR I	$295	$209
QUADCOLOR II	$560	$409
64K EXPANDABLE BOARD	$395	$269
QUADBOARD EXP TO 384K	$395	$269
Hercules*		
GRAPHICS CARD	$499	$349
COLOR CARD	$245	$175
MEMORY CHIPS (64K)		$ 55

- Special Corporate Incentives
- Cumulative/Quantity Discounts
- Same Day Shipment
- Overnight Delivery Available
- Purchase Orders Accepted From Qualified Organizations
- IBM,* CPM,* Apple* formats
- Expert Technical Assistance
- Full Product Guarantees
- Visa, M/C, Amer. Exp
- Free UPS Surface w/Ppd Check

TO ORDER CALL TOLL-FREE 1-800-227-0545

Software Specialists For The IBM PC

Diamond Software Supply

484 Lake Park Ave Suite 123 Oakland CA 94610

For price quotes, information, or in California call 1-415-893-7676 We credit your order for the call **Technical Department** (415) 893-7678 International Telex 338139 (attn 149)

IBM is a trademark of International Business Machines CPM is a trademark of Digital Research Apple is a trademark of Apple Computer Inc

CIRCLE 307 ON READER SERVICE CARD

Copyrighted material

It all adds up...

MODEMS

ANCHOR

Volksmodem	$59 99
Mark VI	$169 00
Mark XII (12 Baud)	$259 00

HAYES

Smartmodem 300	$199.00
Smartmodem 1200B	$419.00
Smartmodem 1200	$469.00
SmartCom II	$75.99
Chronograph	$199 00

NOVATION

J Cat	$99 99
Smart Cat Plus	$339 00
Smart Cat 103	$179 00
Smart Cat 103/212	$399.00

MICROSTUF

Crosstalk XVI	$105.00
Remote	$99.99

MONITORS

AMDEK

300 Green	$129 00
300 Amber	$149 00
310 Amber IBM Plug	$169.00
Color 300/Audio	$269 00
Color 500 Composit/BRGB/VCR	$389 00
Color 600 Hi-Res (640x240)	$439 00
Color 700 Hi Res (720x240)	$499 00
Color 710 Long Phosphor	$599 00

BMC

1201	$88 99
9191 Color Plus	$249 00

NEC

JB 1201 Green	$139 00
JB 1205 Amber	$149 00
JC 1215 Color	$269.00
JC 1216 RGB	$429 00

PRINCETON GRAPHICS

Max 12 Mono	$199 00
HX-12 RGB	$469 00
SR-12 RGB	$629 00

QUADRAM

8400 RGB	$469 00

TAXAN

100G Green	$125 00
105A Amber	$135 00
121 IBM Green	$149 00
122 IBM Amber	$159 00
210 RGB Composite	$269 00
420 Hi Res RGB	$469.00

ZENITH

ZVM 122 Amber	$99 99
ZVM 123 Green	$89 99
ZVM 124 IBM Amber	$149 00
ZVM 131 Color	$309 00
ZVM 133 RGB	$429 00
ZVM 135 RGB Composite	$469 00
ZVM 136 RGB	$629 00

DISK DRIVES

TANDON

5¼" 320K TM 100 2	$189 00

IDEAdisk

5MB to 45MB Hard-drives with removable Cart. Backup	as low as $1399 00

'ONE YEAR TRADE UP'

PRINTERS

BMC

BX 80 Dot Matrix	$239 00
BX-100 Dot Matrix	$259.00
401 Letter Quality	$589 00

C.ITOH

Prowriter 8510P	$339.00
Son of Starwriter A10P	$569 00
Starwriter F10-40P	$949 00
Printmaster F10-55P	$1249.00

COMREX

Comwriter II Letter Quality	$449 00

DAISYWRITER

2000	$949 00

DIABLO

36	$1399.00
620 Letter Quality	$949 00
630-API Letter Quality	$1649.00
630 ECS	$2099 00

EPSON

RX80, RX80FT, RX100		CALL
FX80 FX100	NEW	CALL
LQ 1500	LOW	CALL
JX-80 Color	PRICES	CALL

IDS

Prism 80/132	CALL

JUKI

6100	$469 00

MANNESMANN TALLY

Spirit 80	$269.00
160I	$589 00
180L	$749 00

NEC

8027	$389 00
8050-IBM	$749.00
3550 IBM	$1499 00
7730	$1799 00
8850 IBM	$1799 00

OKIDATA

82, 83, 84	CALL
92, 93, 2350, 2410	CALL

OLYMPIA

Compact 2 Letter Quality	$469.00
Compact RO	$499 00
ESW 3000	$1399 00
Needlepoint Dot Matrix	$329 00

SILVER REED

EXPRESS Quality 500	$379.00
Letter Quality 550	$469 00
Letter Quality 770	$[illegible]

SMITH CORONA

TP-1000	$449.00

STAR GEMINI

Gemini 10XPC	$259 00
Gemini 15XPC	$389 00
Radix 10 PC	$549 00
Radix 15 PC	$649 00
Powertype	$329 00

TOSHIBA

1340	$799.00
1351	$1369 00

CARDS

AST RESEARCH

MEGA PLUS II as low as	$299 00
I/O-PLUS II as low as	$139 00
SIXPAKPLUS as low as	$249 00

MAIN FRAME

AST 5251	$699 00
AST-SNA	$699 00
AST-BSC	$699.00
AST-3870	$749 00

MONOGRAPH PLUS

Video Board	CALL

IDEAssociates

IEDAboard MPR-64 as low as	$219 00
IDEAplus XPR-64 CSP as low as	$279.00
IDEAmax ZPR-64 CSP as low as	$279 00
IDEAmax ZPR-0K CSPG as low as	$229.00
IDEAcomm CPR 3278	$799 00
IDEA 1200 Modem	$349.00

QUADRAM

Quadlink 64K	$479 00
Quadboard II as low as	$309.00
New Expanded Quadboard as low as	$279.00
Quad 512 Plus as low as	$259 00
Quad I/O	$199 00

QUADCOLOR

Quadcolor I	$219.00
Quadcolor II (640 x 200)	$449.00
Upgrade I-II	$239.00

QUADDISK

6 12 20 27 32 Meg	starting at $1799

CHRONOGRAPH

Clock/Calendar	$89 99

PARALLEL BOARD

Printer Interface w/8' Cable	$89 99

QUADJET

QJ9000 Ink Jet Printer	$749 00

MICROFAZER

Call for Configurations...P/P, P/S, S/S, S/P Starting at	$189.00

EFAZER

Epson Internal Buffers

8K	$69 99
64K	$149 00

AMDEK

MAI	$359 00

HERCULES

Color Graphics	$199.00
Monochrome Graphics	$229.00

EAGLE

PC Color Card	$229 00

PARADISE

Multi Display Card	$339 00
Modular Graphics Card	$319.00

TAC

IRMA 3270	$1049 00

PC PLUS PRODUCTS

Plantronics Color Plus	$399.00

PEACOCK

For product information	CALL

TECMAR

For product information	CALL

KEYTRONICS

5150 Keyboard	CALL
5151 Keyboard	CALL

MEMORY CHIPS

4164 Ram Chips (set of 9)	$44.99

KOALA

Koala Pad w Micro Painter	$95 99

PERSONAL PERIPHERALS

Super Sketch Graphics Pad	$39 99

COMPUTER MAIL ORDER

VISA

MasterCard

west
800-648-3311
In NV call (702)588-5654
Order Status Number: 588 5654
P.O.Box 6689, **Dept.130**
Stateline, NV 89449

canada
Ontario/Quebec 800-268-3974
Other Provinces800-268-4559
In Toronto call (416) 828-0866
Telex: 06-218960
2505 Dunwin Drive, Unit 3B, **Dept.130**
Mississauga, Ontario, Canada L5L1T1

east
800-233-8950
In PA call (717)327-9575
Order Status Number: 327-9576
Customer Service Number: 327-1480
477 E. 3rd St., **Dept.130,** Williamsport, PA 17701

No risk, no deposit on C.O.D. orders and no waiting period for certified checks or money orders. Add 3% (minimum $5) shipping and handling on all orders. Larger shipments may require additional charges. NV and PA residents add sales tax. All items subject to availability and price change. Call today for our catalog.

the best prices

CALL FOR YOUR FAVORITE PC/COMPATIBLE

Columbia Data
Compaq
Eagle
Sanyo
TeleVideo
Zenith

Corporate Buyers Are Welcome !!!!

SOFTWARE

ASHTON-TATE
- Framework $399.00
- dBASE II $299.00
- dBASE II upgrade $149.00
- dBase III $399.00
- Friday $179.00

ALPHA SOFTWARE
- Electronic Desk $219.00

CDEX
- Training Programs ..... each ... $49.99

CONTINENTAL SOFTWARE
- Home Accountant Plus $88.99
- 1st Class Mail $79.99

ELECTRONIC ARTS
- Get Organized $139.00

FOX & GELLER
- QZZ $289.00
- Grafox $199.00
- dUtil $69.99
- dGraph $199.00
- Quickcode $199.00

FUNK SOFTWARE
- Sideways $59.99

HAYES
- Please $269.00

HARVARD
- Harvard Project Manager $229.00

IUS
- EasyFiler $229.00
- EasyPlanner $159.00
- EasyWriter II (spell/write/mail) $249.00

LEXISOFT
- Spell Check $199.00
- Spell Binder $259.00

LIFETREE SOFTWARE
- Volkswriter $115.00
- Volkswriter Deluxe $179.00

LOTUS
- 1-2-3 ..... $319.00
- Symphony $499.00

MAI
- General Ledger ..... CALL
- Accounts Receivable ..... CALL
- Accounts Payable ..... CALL
- Payroll ..... CALL
- Accounting Software ..... CALL

MICROPRO
- WordStar ProPack $339.00
- WordStar ProPack Plus $419.00
- WordStar $219.00
- MailMerge $159.00
- InfoStar Plus $399.00
- CalcStar $109.00

MICROSOFT
- Multi Plan $139.00
- Multi Tool Word w/Mouse $299.00

MULTIMATE INT.
- Multi Mate $289.00

PEACHTREE SOFTWARE
- Peachtext 5000 ..... $209.00
- Peachpack (GL/AP/AR) $219.00

PFS
- File $89.99
- Report $79.99
- Graph $89.99
- Write $89.99
- Proof $89.99
- Access $85.99
- Plan $89.99

ROSESOFT
- Pro Key $89.99

SOFTWARE ARTS
- TK Solver $279.00

SSI
- Word Perfect $275.00

SYNAPSE
- File Manager Plus $59.99

VISICORP
- VisiCalc 4 ..... $159.00
- VisiWord/Spell $149.00
- VisiFile $119.00
- VisiSchedule $149.00
- Desktop Plan $199.00
- Business Forecast Model $75.99
- Visi-On Series ..... CALL

MICROMIM
- R Base 4000 ..... $279.00

PROFESSIONAL SOFTWARE
- PC Plus/The Boss $269.00

CIRCLE 183 ON READER SERVICE CARD

SPI
- Open Access $339.00

SPINNAKER
- Fraction Fever $24.99
- Story Machine $24.99
- KinderComp $22.99
- Facemaker $24.99
- Hey Diddle Diddle $22.99
- Rhymes & Riddles $22.99
- Snooper Troops 1 or 2 ..... $24.99
- Search of Most Amazing Thing $24.99

INFOCOM
- Witness $29.99
- Enchanter $29.99
- Planetfall $29.99
- Suspended $29.99
- Starcross $27.99
- Zork 1, 2, or 3 ..... $27.99
- Infidel $29.99

CENTRAL POINT
- PC Copy II $32.99

DISKETTES

MAXELL
- MD-1 ..... $19.99
- MD-2 ..... $29.99

ELEPHANT DENNISON
- SS/SD EM-1 ..... $16.99
- SS/DD EM-2 ..... $17.99
- DS/DD EM-5 ..... $26.99
- EMSF-5 DS/DD $34.99

VERBATIM
- SS/DD $21.99
- DS/DD $29.99

COMPUTER MAIL ORDER

VISA

west
800-648-3311
In NV call (702)688-5654
Order Status Number 588-5654
P.O.Box 6689, **Dept.130**
Stateline, NV 89449

canada
Ontario/Quebec 800-268-3974
Other Provinces800-268-4559
In Toronto call (416) 828-0866
Telex. 06-218960
2505 Dunwin Drive, Unit 3B, **Dept.130**
Mississauga, Ontario, Canada L5L1T1

east
800-233-8950
In PA call (717)327-9575
Order Status Number 327-9576
Customer Service Number: 327-1450
477 E. 3rd St., **Dept.130,** Williamsport, PA 17701

MasterCard

CANADIAN ORDERS: All prices are subject to shipping, tax and currency fluctuations. Call for exact pricing in Canada. INTERNATIONAL ORDERS: All orders placed with U.S. offices for delivery outside the Continental United States must be pre-paid by certified check only. Include 3% (minimum $5) shipping and handling. EDUCATIONAL DISCOUNTS: Additional discounts are available to qualified Educational Institutions. APO & FPO: Add 3% (minimum $5) shipping and handling.

"I LEARNED HOW TO RUN MY IBM PC FROM MY BROTHER-IN-LAW ON THE 17TH GREEN...

HE'S A TERRIBLE GOLFER, TOO!"

HOW TO GET EVERYTHING OUT OF YOUR IBM PC THAT IBM PUT INTO IT.

At one time or another, we've all listened to some "expert" advice. But when you're dealing with something as advanced as the IBM PC, word-of-mouth advice just won't do.

That's why you need Vencompass Knowledge Systems. One-on-one, color video cassette instructions that teach you everything about your IBM PC. With instant playback capabilities that let you view any section over and over again.

Each of the Vencompass, Inc. Knowledge Systems video cassettes was written and created by some of the most knowledgeable experts in their field...the Panel of Excellence. Three members worked together on the IBM PC video cassettes to ensure that every point is raised and explained.

Thomas L. Venable, Chairman of the Board and President of a small public international electronics company, worked closely with Russell J. Forquer, Account Marketing Representative for the IBM Corporation, to integrate the IBM PC into the day to day systems procedure of his five manufacturing facilities.

Venable's expertise in computer systems procedures has been described in *Forbes Magazine* and the *Wall Street Journal*.

Jon VanAmringe uses the IBM PC on a daily basis to assist him in project analysis, materials planning, word processing and budget applications. Mr. VanAmringe has the responsibility for monitoring the continuing IBM PC systems project at Spectrum Control.

Here's what you'll learn from the Panel members in the "How To Set Up The IBM PC" video cassette:

- A live demonstration highlighting the functions of the entire system.
- Becoming familiar with the keyboard.
- How to get your printer on-line quickly.
- A Diagnostic Instruction Problem Analysis.
- Thorough schooling in all the functions of your IBM PC.

The "How To Use IBM PC DOS 2.0" video cassette shows you:

- How DOS 2.0 acts as an interpreter between you and your computer.
- A live demonstration on how DOS makes your job easier.
- You'll learn and master DOS commands.

Plus you also receive:

- Textbook (DOS 2.0 Only).
- Blank Diskettes.
- Sample File Diskette.
- Drive Identifiers.
- Starter Package of Printer Paper.
- Workbook.
- Library Case Package.

Now there's no reason to suffer confusion and panic over your IBM PC. Complete the attached order form and get your video cassettes today. And start getting the most out of your IBM PC.

Yes, I am interested in learning how to get the most out of my IBM PC. Please rush me:

___ "How To Set Up The IBM PC" video cassette(s) at $195 each.
___ "How To Use IBM PC DOS 2.0" video cassette(s) at $285 each.
___ VHS ___ BETA ___ ¾ Inch
___ Check Enclosed ___ Bill My Company
___ MasterCard ___ VISA
Credit Card Number _____
Expiration Date _____
___ Send all available literature.

1-800-458-4114 In Pennsylvania 1-800-352-2112

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
PHONE _____

VENCOMPASS, INC. • 155 WEST EIGHTH STREET • ERIE, PA 16501 PC 1

vencompass,inc

VENCOMPASS KNOWLEDGE SYSTEMS

• *ENCOMPASSING TOMORROW'S TECHNOLOGY FOR TODAY'S USE* •

IBM PC is a trademark of International Business Machines Corporation.

CIRCLE 138 ON READER SERVICE CARD

Softline

THE PROFESSIONAL'S CHOICE

WORD PROCESSING/ EDITORS

Easywriter II System	$219
Fancy Font	$159
Final Word	$189
Microsoft Word	$239
Microsoft Word/Mouse	$299
Multimate	$269
PeachText 5000	$199
PFS: Write	$ 95
Samna Word III	$Call
Volkswriter Deluxe	$169
The Word Plus (Oasis)	$109
Word Perfect (SSI)	$249
WordPlus-PC with The Boss	$319
WordStar	$219
WordStar Professional (WS/MM/SS/SI)	$279
WordStar Options Pak (MM/SS/SI)	$189
XYWrite II+	$229

SPREADSHEETS/ INTEGRATED PACKAGES

Aura 5	$329
Electric Desk	$229
Framework	$369
Integrated 7	$339
Jack 2	$329
Lotus 1-2-3	$309
Multiplan	$135
Open Access	$299
Smart System	$579
SuperCalc 3	$219
Symphony	$429
TKI Solver	$269
VisiCalc IV	$159

COMMUNICATIONS/ PRODUCTIVITY TOOLS

Crosstalk	$119
Memory Shift	$ 79
Move It	$109
Prokey 3.0	$ 95
Relay	$ 99
Smartcom II	$109

DATABASE SYSTEMS

Alpha Data Base Manager II	$179
Condor III	$299
dBase II	$279
dBase III	$369
DBplus	$ 89
Friday	$179
InfoStar+	$289
Knowledgeman	$299
PFS: File/PFS: Report	$169
Powerbase	$239
QuickCode	$159
R base 4000	$269
TIM IV	$249
Versaform	$249

LANGUAGES/UTILITIES

Concurrent w/Windows	$219
Digital Research C Compiler	$219
DR Fortran 77	$219
Lattice 'C'	$299
Microsoft C Compiler	$309
MS Basic Compiler	$249
MS Fortran	$239
Norton Utilities	$ 59

PROJECT MANAGEMENT

Harvard Project Manager	$239
Microsoft Project	$169
Scitor Project 5000	$299
VisiSchedule	$199

ACCOUNTING MODULES

BPI Accounting	$369
IUS EasyBusiness System	$319
MBA Accounting	$369
Open Systems Accounting	$429
Peachpak 4 (GL/AP/AR)	$239
Peachtree Accounting	$299
Real World Accounting	$469
Star Accounting Partner (GL/AP/AR/PAY)	$249
Star Accounting Partner II	$699

GRAPHICS/STATISTICS

Abstat	$279
BPS Business Graphics	$229
Chartmaster	$259
DR Draw	$199
Energraphics w/Plotter	$319
Execuvision	$279
Fast Graphs	$219
Graphwriter Combo	$399
MS Chart	$169
PC Draw	$279
PFS. Graph	$ 95
Signmaster	$199
Statpak-NWA	$329
Statpac-Walonick	$299

PROFESSIONAL DEVELOPMENT

Management Edge	$169
Think Tank	$129

HOME/PERSONAL FINANCE

Dollars and Sense	$119
Financier II	$119
Home Accountant Plus	$ 99
Sundex-CPA	$109

HARDWARE/ PERIPHERALS*

AST Six Pack Plus (64k)	$269
Quadboard (0k)	$Call
Hayes 1200B with Smartcom	$399
Hayes Smartmodem 1200	$489
Keytronic 5151 DLX	$209
IRMA	$995
Hercules Graphics Board	$349
Epson FX-100 Printer	$Call
Comrex II Printer	$Call
C Itoh Prowriter	$Call
Okidata 93A	$689
Toshiba P1351 Printer	$Call
64K Memory	$ 55

*Call for shipping

Lotus 1-2-3 $309	Symphony $429
dBase III $369	FrameWork $369
MultiMate $269	Volkswriter DLX $169
R:base 4000 $269	WordStar Professional $279
AST 6 Pak Plus $269	Smartmodem 1200B $399
Quad Board Expanded 64K $279	Smartmodem 1200 $489

To Order call

1-800-221-1260

In New York State call (718) 438-6057

For technical support and information call (718) 438-6057

LOWEST PRICE GUARANTEE!!

We will match current nationally advertised prices on most products. Call and compare.

FREE!

Diskette Library Case

. . . with your order. This attractive case protects, indexes and stores 10 diskettes for quick retrieval. Normally a $10 value, it is now available ***FREE*** to Softline customers

TERMS:
Checks—allow 14 days to clear. Credit processing—add 3%. COD orders—cash, M.O. or certified check—add $3.00. Shipping and handling UPS surface—add $3 00 per item (UPS Blue $6.00 per item). NY State Residents—add applicable sales tax. All prices subject to change

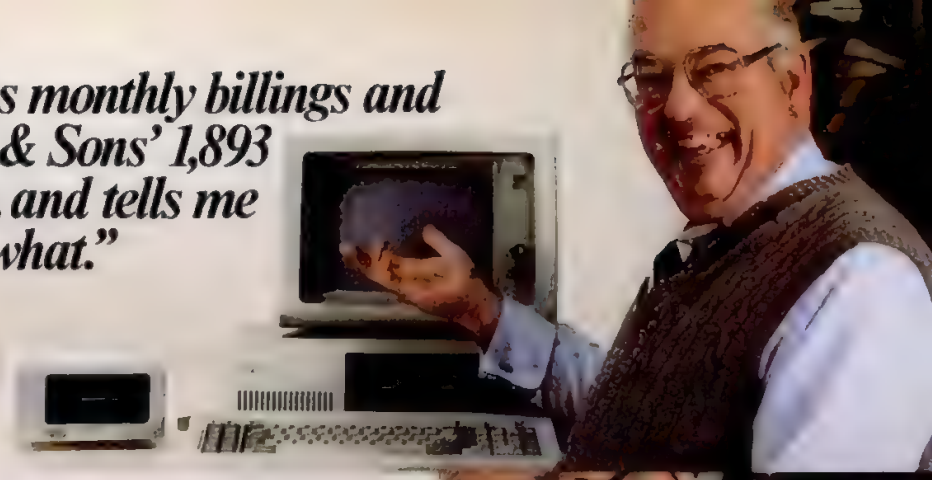
MasterCard VISA

Softline

Softline Corporation
P.O. Box 729, Brooklyn, N.Y. 11230
TELEX 421047 ATLN UI

"My IBM® PC XT™ writes monthly billings and statements to Maxwell & Sons' 1,893 customers, and tells me who owes what."

When you work with a lot of information, you can't afford to re-enter every file when your hard disk fails. And no hard disk is fail-safe.



"My Sysgen Image™ backs up the whole lot in less than five minutes. 10 megabytes on a single cassette..."

The Sysgen Image backs up the hard disk in your IBM PC XT. So you can protect your files in minutes—instead of spending hours re-entering them.

"For just $995. That's cheap insurance. It lets me sleep at night."

The Sysgen Image for just $995. It's the most affordable insurance you can buy for your two most important assets: Your information. And your time.

Sysgen. Because a hard disk without tape just doesn't make sense.

Sysgen products for the IBM® PC, PC XT, and other personal computers: Economical, 10- and 20-Megabyte hard disk systems with tape back-up. Or 10-Megabyte tape back-up for the IBM PC XT.

Go to your local computer dealer. Ask for a demonstration of Sysgen back-up systems. And find out how to make sense of your storage.

47853 Warm Springs Blvd., Fremont, CA 94539
(415) 490-6770 Telex 4990843

SYSGEN
INCORPORATED

IBM is a registered trademark and PC XT is a trademark of International Business Machines Corporation. Sysgen Image is a trademark of Sysgen, Incorporated

IBM on Trial

It's been said that what's good for General Motors is good for the country. Is the same true of IBM, or will its corporate bullying sculpt free enterprise into a Big Blue monolith?

IBM doesn't care.

Whether you buy Juniors or PCs or ATs. Whether you buy them through a Product Center, a local dealer, or National Account sales. IBM doesn't care, just as long as you buy IBM.

That doesn't sound like much of a problem, but it is. It's a problem for you, for me, for the entire industry. IBM's attitude toward distribution can have a profound effect on the entire personal computer market.

Imperialist Marketing

Seasoned data processing managers tell wry stories about their long-term dealings with IBM sales reps:

"Yes, I understand that you're experiencing contention between your IMS applications and the on-line applications. We've got a fix for it, but frankly, it won't work with your TP monitor. All you have to do is switch over to CICS. You're also running out of MIPS. I'll put a proposal together and get it to you by the end of the week. . . . "

The IBM sales technique is called account control. In order to ensure your livelihood, you control all aspects of the manufacture, sale, and service process. Trouble is, in this total, almost imperial approach to the market, some non-IBM interest generally takes a beating.

Nearly everyone has heard a story or two about a DP manager in an IBM shop who has been attracted to one minicomputer or another. He decides that a DEC or an HP or a DG is the right choice for a given application. When IBM gets wind of it, the sales reps realize that they're losing account control. They bring in the dog and pony show, do everything they can to turn the decision around. The DP manager is ummoved. He's made up his mind.

Bill Machrone

Then the chairman of the DP manager's company gets a call from the IBM regional manager. He's invited to lunch at the club, a round of golf, or an afternoon of sportfishing.

The regional manager turns out to be extremely well informed about the nature of the chairman's business. He knows the challenges that lie ahead and can talk intelligently about where the business will be in 5 years. After the appropriate amount of socializing, the regional manager informs the chairman gravely, "We believe that one of your people is about to make a poor decision, one that will hurt your business."

The hapless DP manager never knows what hit him. Whether it ends in demoralization, disgrace, or demotion, events will not go as he planned. Nothing personal against him on IBM's part—the sales team is just doing its job of account control.

Retail Woes

Dealers can (and must, if they are to be good ones) carry more than the IBM line. This is a threat to IBM's account control. The only way IBM can preserve its dominion is to compete with dealers that sell its own products.

A businessman goes into an IBM dealership. He knows that he needs to automate his inventory, and friends have advised him to buy IBM. This makes sense to him: All of his firm's typewriters are Selectrics and Electronics, and he's surveyed the field and realizes that PCs dominate the small-business applications market.

The dealer has a small outside sales

PC NETWORK

BUY HARDWARE AND SOFTWARE AT WHOLESALE +8%, AND GET 14-28 DAY SOFTWARE RENTALS† . . .

In just the last few months, *The NETWORK* has saved its members more than $18,000,000 and processed over 45,000 orders.

Listed below are just a few of the over 20,000 products available at our EVERYDAY LOW PRICES! All software below is priced in IBM-PC format.

The nation's largest corporations depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial industrial and professional concerns ***including some of the most important names in the computer industry:***

AT&T	*Harvard University*
Barclays Bank	***Hewlett Packard***
Bell & Howell	*Hughes Aircraft*
Citibank	***IBM***
Columbia University	***ITT***
Data General	*Kodak*
Farm Bureau Insurance	***Multimate***
Frontier Airlines	*Standard Oil of Ohio*
General Mills	*University of Chicago*
Gillette	*Veteran's Administration*

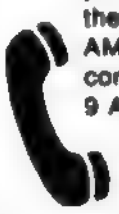
plus thousands of satisfied consulting firms, small businesses, user groups, municipalities, government agencies and valuewise individuals ACROSS THE NATION! Their buyers know that purchasing or renting from PC NETWORK saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

CALL TOLL FREE
1-800-621-S-A-V-E

In Illinois call (312) 280-0002

Your Membership Validation Number: A1B1

You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your VISA, MASTERCARD or AMERICAN EXPRESS. Our knowledgeable service consultants are on duty Mon-Fri 8 AM to 7 PM, SAT 9 AM to 5 PM CST.



PERSONAL COMPUTER NETWORK
320 West Ohio
Chicago, Illinois 60610

Call now...Join the PC NETWORK and start saving today!

PRICING MADNESS

Once again, as Federal Express picks up our ad at the very last millisecond before this issue's advertising deadline, ***here we sit with dozens of price reductions and new product announcements which have arrived too late for us to let you know.***

Why, our ad manager asks, do we always go through a last minute price update frenzy, just seconds before our ad is due at the publisher, when we know that despite our heroic effort, ***many of these products will cost even less by the time you read this ad.***

How he asks, can we get a crystal ball to forecast what fantastic promotions and specials our suppliers are going to offer from now to the date this ad gets to the newsstand ***over two months from today?***

Well, we decided that he has a good point. While we'll still keep getting our grey hairs and ulcers from last minute revisions, we will start publishing this notice and ask our readers to make a simple check. Look at any four back issues of this magazine (*yes we're in every one*) and track the prices on the most popular products. ***You will see that many drop with every issue.*** Most of these price changes were instituted well before the issue was printed and ***our members always pay the lower price.*** This should prove that this notice is much more than hype.

Given the current madness in the PC industry with its spur of the moment pricing and instant product introductions, ***you will find it always pays to call for our latest prices.*** You will be glad you did.

GAMES & EDUCATIONAL SOFTWARE

(Please add $1 shipping and handling for each title ordered from below.)

	Wholesale		Wholesale
Avant-Garde *Air Traffic Controller*	$16.50*	**Sierra On-Line** *Frogger*	21.00*
Bluebush *Chess (Your Toughest Opponent)*	34.00*	**Sierra On-Line** *Crossfire*	16.00*
Broderbund *Lode Runner*	19.75*	**SubLogic** *Night Mission Pinball*	24.00*
CBS *Goren-Bridge Made Easy*	46.00*	**Spinnaker** *Alphabet Zoo*	17.00*
CBS *Mastering the SAT*	81.00*	**Spinnaker** *Delta Drawing*	29.00*
Epyx *Temple of Apshai*	21.97*	**Spinnaker** *FaceMaker*	20.00*
Infocom *Zork I, II, or III*	21.50*	**Spinnaker** *Hey Diddle Diddle*	17.00*
Infocom *Deadline, Witness or Suspended*	27.00*	**Spinnaker** *KinderComp*	17.00*
Microsoft *Flight Simulator*	27.00*	**Spinnaker** *Rhymes & Riddles*	17.00*
Orion *JBird (QBert Look Alike)*	22.00*	**Spinnaker** *Story Machine*	20.00*
Scarborough *Mastertype*	27.00*	**Spinnaker** *Most Amazing Thing*	23.00*
Screenplay *Asylum (works with mono card too)*	15.50*	**Virtual Combinatics** *Micro Cookbook*	21.00*

BUSINESS SOFTWARE

(Please add $2.50 shipping and handling for each title ordered from below.)

ATI *How to use MultiMate*	$42.00*	**Microsoft** *Word with Mouse—Latest Version*	255.00*
ATI *How to use Microsoft Word*	42.00*	**Microsoft** *Multiplan*	106.00*
ATI *How to use Lotus 1-2-3*	42.00*	**Monogram** *Dollars & Sense*	89.00*
Ashton-Tate *DBASE III*	CALL	► **Multimate** *Multimate (Latest Version)*	240.00*
Ashton-Tate *Framework*	CALL	**Oasis** *The Word Plus*	90.00*
Ashton-Tate *Friday!*	158.00*	**Open Systems** *P/O Sales A/R INV G/L A/P Team Mgr*	370.00*ea
Central Point *Copy II PC*	23.00*	**RDS** *Informix*	510.00*
Conceptual Instruments *Desk Organizer*	177.00*	**Real World** *G/L A/P A/R P/R or OE/INV*	387.50*ea
Cosmos *Revelation (Requires 8087)*	575.00*	**Rosesoft** *Prokey Version 3*	74.00*
Digital Research *CP/M-86*	33.00*	**Ryan McFarland** *RM COBOL (Dev. System)*	570.00*
Digital Research *DR Logo*	57.00*	**Samna** *Samna III Word Processor*	325.00*
Digital Research *PL/I Compiler*	300.00*	**Satellite Software** *WordPerfect*	210.00*
Digital Research *Concurrent CP/M—Windows*	90.00*	**Softcraft** *Fancy Fonts*	125.00*
Funk Software *Sideways*	36.00*	**Softstyle** *SET-FX*	35.00*
Harvard *Harvard Project Manager*	215.00*	**Software Publishing** *PFS File*	72.00*
Hayes *Smartcom II*	68.00*	**Software Publishing** *PFS Report*	64.00*
Human Edge *The Management Edge*	145.00*	**Software Publishing** *PFS Write*	72.00*
Human Edge *The Sales Edge*	145.00*	**Software Publishing** *PFS Graph*	72.00*
► **Lotus Development** *Lotus 1-2-3*	270.00*	**TCS** *Client Ledger*	730.00*
Lotus Development *Symphony*	CALL	**Verbatim** *Disk Drive Analyzer*	25.00*
MicroRim *RBase 4000*	230.00*		
Microsoft *C Compiler*	275.00*		

HARDWARE

(Please add shipping and handling charges found in italics next to price.)

COMPLETE SYSTEMS

Apple *Macintosh Base System*	1,590.00*	*(34.12)*
Apple *Apple //c*	800.00*	*(18.58)*
Apple *Apple //e*	CALL	
Columbia *Desktop & Portable Systems*	CALL	
Compaq *All Models*	CALL	
Eagle *Desktop PC and Spirit Portables*	CALL	
► **IBM** *PC Starter System 1 DSDD/ FDC/Color CD/Par Port/Monitor/64K*	1,687.00*	*(36.01)*
► **IBM** *PC Base System 2 DSDD/FDC/256K*	1,687.90*	*(35.81)*
► **IBM** *PC Professional Hard Disk (XT) (1 DSDD/FDC/10 MB Hard Disk/256K*	2,282.90*	*(49.31)*
IBM *PC/AT All Configs*	CALL	
Sanyo *MBC 550 "Lowest Cost Compatible"*	640.00*	*(13.82)*
Tava *PC Complete IBM Compatible (64K/Color or Mono Card/2 drives)*	1,460.00*	*(31.32)*
Texas Instruments *Professional*	CALL	

DISK DRIVES & CONTROLLERS

► **Cogito** *1/2 Ht Low Power 10MB Winchester W/IBM Controller*	735.00*	*(15.63)*
IBM *Floppy Disk Controller*	75.00*	*(2.50)*
► **Maynard** *WS-1 10MB Internal Hard Disk with Sandstar Multi Function Card*	770.00*	*(18.15)*
► **Maynard** *WS-2 same as WS-1 but with Sandstar Floppy Controller (uses 1 slot)*	930.00*	*(20.30)*
Maynard *Floppy Controller/Serial Port*	145.00*	*(2.50)*
► **Panasonic** *Half Height DSDD Drive Pair*	258.00*	*(5.40)*
Qume *Half Height DSDD Drive Pair (Same as used on IBM Portable)*	350.00*	*(7.00)*
► **Tandon** *TM100-2 Full Height DSDD Drive*	153.00*	*(3.16)*
Tallgrass *20MB External Hard Disk with Tape Backup*	2,800.00*	*(46.20)*
► **Teac** *FD55-B Half Height DSDD Drive Pair*	265.00*	*(5.72)*

MEMORY CHIPS

All chips guaranteed for life

► **64K Memory Upgrade Kits (9 Chips)**	37.00*	*(1.00)*
► **64K Dynamic Ram Chips (Each)**	4.20*	*(1.00)*
256K Dynamic Ram Chips (Each)	33.00*	*(1.00)*

MODEMS

Anchor *Mark XII LOWEST PRICE 1200BPS HAYES COMPATIBLE EXTERNAL MODEM!*	230.00*	*(5.00)*
Hayes *Smartmodem 300*	180.00*	*(3.60)*
Hayes *Smartmodem 1200B with new Smartcom II VT100 Emulator*	366.90*	*(2.50)*
Rixon *R212A Stand Alone 1200BPS*	335.00*	*(8.50)*
U.S. Robotics *Password (Compact 1200BPS External)*	290.00*	*(6.50)*
Ven-Tel *PC Modem Half Card for PC/XT/Portable w/Crosstalk*	390.00*	*(2.50)*

MONITORS

Amdek *Video 300G Composite Green*	110.00*	*(3.00)*
Amdek *Video 300A Composite Amber*	120.00*	*(3.00)*
Amdek *Video 310A IBM Type Amber*	130.00*	*(3.00)*
Amdek *Color 300 (NEW!) Composite*	215.00*	*(4.64)*
Amdek *Color 500 (NEW!) Composite/RGB/VCR*	320.00*	*(6.91)*
Amdek *Color 600 (NEW!) High Res RGB*	395.00*	*(8.53)*
Amdek *Color 700 (NEW!) Ultra High Res*	455.00*	*(9.83)*
Amdek *Color 710 (NEW!) 700 w/Non-Glare/Long Phosphor*	485.00*	*(10.48)*
Princeton *HX-12 RGB Monitor*	CALL	
Princeton *MAX-12 IBM Mono*	CALL	
Princeton *SR 12 Ultra High Res RGB*	CALL	
► **Quadram** *Quadchrome II NEW! 640x200 RGB w/.14 Screen/ Black Phosphor Mask/IBM Case*	370.00*	*(8.21)*
Taxan *420 Super High Res RGB Monitor*	380.00*	*(8.21)*
Taxan *440 Highest Res RGB (720x400) Currently Available Works With Persyst Bob Card*	525.00*	*(11.34)*
Zenith *ZVM-123 Green High Res (Consumer Reports Rated Best Buy!)*	79.00*	*(2.50)*

*PC NETWORK Members pay just 8% above the wholesale price, plus shipping. All prices reflect a 3% cash discount. Minimum shipping 2.50 per order

MULTIFUNCTION CARDS

Apparat *256K Memory Board with OK*	67.00*	*(2.50)*
Apparat *Combo II w/ser/par/game/ clock/sher*	123.00*	*(2.50)*
► **AST** *Six-Pack Plus with OK*	197.00*	*(2.50)*
AST *MegaPlus II with OK*	205.00*	*(2.50)*
AST *I/O Plus II*	105.00*	*(2.50)*
► **ORCHID BLOSSOM W/64K** *Multifunction with networking at an unbelievable price Up to 384K/ Ser/Par/Clock/Software/Net Slot*	205.00*	*(2.50)*
► **Quadram** *Improved Quadboard w/OK Special Purchase!*	185.00*	*(2.50)*
Tecmar *Captain Multifunction Card O/K*	280.00*	*(2.50)*

PRINTERS

Amdek *5025 (NEW!) 25CPS LQ w/2K Buffer*	525.00*	*(10.48)*
C. Itoh *F10/40 Starwriter 40 CPS LQ*	675.00*	*(18.90)*
C. Itoh *Prowriter 8510 AP*	285.00*	*(8.16)*
Epson *RX-80*	267.00*	*(8.00)*
Epson *FX-80*	415.00*	*(9.25)*
Epson *FX-100*	690.00*	*(14.35)*
Epson *LQ1500*	CALL	
Epson *IBM-to-EPSON Parallel Cable*	21.00*	*(1.00)*
NEC *2030 20CPS LQ Parallel*	525.00*	*(16.53)*
NEC *2050 20CPS Letter Quality Printer*	765.00*	*(16.53)*
NEC *3530 33CPS LQ Parallel*	1,185.00*	*(31.54)*
NEC *3550 33CPS Letter Quality Printer*	1,480.00*	*(31.54)*
NEC *8850 55CPS LQ New Model IBM Version*	1,710.00*	*(36.04)*
Okidata *ML84P 200CPS 132 Col*	720.00*	*(16.00)*
Okidata *ML92P 160CPS 80 Col Printer*	385.00*	*(8.55)*
Okidata *ML93P 160CPS Wide Platen*	680.00*	*(15.00)*
Okidata *2410P Pacemark 350CPS*	1,850.00*	*(60.00)*
Okidata *IBM-to-Okidata Parallel Cable*	29.75*	*(1.00)*
Qume *Sprint 11/45 45CPS Letter Quality*	1,185.00*	*(24.00)*
Qume *Sprint 11/90 90CPS Letter Quality New! Fastest Daisywheel Out!*	CALL	
Qume *IBM Cable and Interface (required)*	72.00*	*(1.00)*
► **Star Micronics** *Gemini 10X 120 CPS w/Tractor Epson Graphics Compatable*	225.00*	*(4.86)*
► **Star Micronics** *Gemini 15X 10X Features w/132 Col*	325.00*	*(7.02)*
► **Star Micronics** *Powertype 18 CPS LQ Diablo Code Compatable*	300.00*	*(6.48)*
Texas Instruments *855 DP/LQ w/Tractor*	718.00*	*(15.50)*
Toshiba *P 1340 80 Col Version of P-1351*	695.00*	*(15.03)*
Toshiba *P-1351 160/100 CPS Draft/LQ LQ Printer*	1,200.00*	*(25.92)*

VIDEO CARDS

► **Amdek** *MAI Card*	310.00*	*(2.50)*
Eagle *Monochrome Display Card*	160.00*	*(2.50)*
► **Hercules** *Monochrome Graphics Card*	209.00*	*(2.50)*
Hercules *Color Card with Parallel Port*	149.90*	*(12.50)*
► **Paradise** *New Modular Multidisplay Card*	CALL	
Persyst *ColorCard*	140.00*	*(2.50)*
Persyst *Bob Card Ultra High Res Color Card with Mono Quality Text in Color*	365.00*	*(2.50)*
Quadram *Quadcolor I Color Card*	170.00*	*(2.50)*
Quadram *Quadvue Mono Card w/Ser/Par/Clock*	210.00*	*(2.50)*
STB *Graphix Plus II NEW! (simultaneous Mono Graphics & Color)*	295.00*	*(2.50)*

ACCESSORIES AND SUPPLIES

► **Brand Name DSDD Diskettes** *Guaranteed for Life!!*	16.00*	*(1.00)*
Curtiss *PC Pedestal II*	36.00*	*(2.50)*
► **Keytronic** *KB5151 Deluxe IBM Keyboard*	179.00*	*(4.00)*
Orchid *PC-Net Starter Kit*	740.00*	*(7.50)*
Source-Tek *Replacement 100W IBM-PC Power Supply fits old PC's Drive Internal Hard Disk & More*	215.00*	*(4.64)*
WP Printer Paper *2600 Sheets Microline Perfs (invisible when torn)*	17.00*	*(10.00)*

†RENT BEFORE YOU BUY—Members are eligible to join The NETWORK's Business and Game Software Rental Libraries and evaluate products for a full 14 (Regular) or 28 (VIP) days to see if it meets your needs. And The NETWORK's rental charges are far less than other software rental services—JUST 20% OF THE MEMBER WHOLESALE PRICE.

Hardware prices highlited by ► reflect recent major price reductions

Join Before Christmas and Get:

- A free box of diskettes..worth $45
- Diskette storage case..worth $10
- Or other special bonuses!

See reverse for details.

PC NETWORK • MEMBERSHIP APPLICATION

YES! Please enroll me as a member in the PC NETWORK™ and rush my catalog featuring thousands of computer products, all at just 8% above DEALER WHOLESALE PRICES. I will also periodically receive "THE PRINTOUT," a special up-date on merchandise at prices BELOW even those in my wholesale catalog, and all the other exclusive, money-saving services available to Members

I am under no obligation to buy anything. My complete satisfaction is guaranteed. Z181 ☐

Please check (✓) all boxes that apply:

Basic Membership
- ☐ One-year membership for $8
- ☐ Two-year membership for $15 (SAVE $1)
- ☐ Business Software Rental Library for $25 add'l per year—members only
- ☐ Games Software Rental Library for $10 add'l per year—members only

Special V I P Membership
- ☐ One-year membership for $15
- ☐ Two-year membership for $25 (SAVE $5)
- ☐ BOTH Business and Game Software Rental Libraries for $30 add'l. per year—V.I.P. members only

☐ Bill my credit card: ☐ VISA ☐ MasterCard ☐ American Express

Account Number: _____ Exp. Date _____ mo year

☐ Check or money order enclosed for $ _____

Name _____

Address _____ Apt No. _____

City _____ State _____ Zip _____

Telephone (_____) _____

My computer(s) is: ☐ IBM PC ☐ Apple II ☐ TRS-80 ☐ Atari ☐ Commodore ☐ Other _____

Signature ✓ _____

(Signature required to validate membership)

Copyright ©1984, PC NETWORK INC.

JOIN THE NETWORK BEFORE CHRISTMAS WITH THE ATTACHED CARD... AND GET THE FOLLOWING SPECIAL BONUS!

Join ***The Network*** today by filling in the attached card and receive one of the following:

With a VIP Rental Membership: *Get a free box of 10 Diskettes!*

With a 2 Year VIP Membership: *Receive a free Plastic Diskette Storage Case and a free Diskette!*

With any Standard VIP 1 Year Membership: *Receive a free Plastic Diskette Storage Case!*

If you choose a Standard 1 Year Regular Membership: *You will receive a free Diskette!*

Two Year Regular Membership: *2 Free Diskettes!*

Any Regular Rental Membership *(Business or Games):* *You may purchase one box of Diskettes* ***For Only $5.00!***

All you need to do is to join ***The Network*** **BEFORE CHRISTMAS** by completing and returning the attached card and enclosing a check, money order or charge your Membership to *Visa, Master Card or American Express.* You will receive a coupon in the mail valid for your bonus redeemable with any order.

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD

First Class Permit No. 14823 Chicago, IL

POSTAGE WILL BE PAID BY ADDRESSEE

PC NETWORK
320 West Ohio
Chicago, Illinois 60610

COMPLETE IBM™ PC SYSTEMS

IBM PC STARTER SYSTEM

IBM PC w/64K (256K capacity) **$1,667.00*** *(36.01)*

Floppy Drive Controller
1 Double Sided Double Density 320/360 Disk Drive
Hercules Color Card w/Parallel Port
Zenith 2VM-123 Display Monitor

CALL FOR LATEST IBM ANNOUNCEMENTS

a double sided drive, color card and printer part allows you to run most any program and grow without need for replacing any component you buy now

IBM PC BASE SYSTEM

IBM PC w/256K **$1,657.90*** *(35.81)*

2 Double Sided Double Density 320/360K Disk Drives

The Base System is your lowest cost starting point for configuring the exact

multifunction cards and accessories listed in this ad, and prove the Network can be best as your system source

IBM PC PROFESSIONAL HARD DISK SYSTEM (XT)

$2,282.90* *(49.31)*

IBM PC w/256K

Floppy Drive Controller
1 Double Sided Double Density 320/360K Disk Drive

CUSTOM CONFIGURATIONS WELCOME

w/Half Height Disk Subsystem:

Half Height 10Mb Drive Allows Room for Addition of Tape Backup in PC!
Twitimes faster than XT!
Automatic Hard Disk Boot Feature

This system increases productivity in any business or professional situation

NETWORK's buying power provides you with better than XT performance at a price lower than you'd expect to pay for a standard PC

These prices have been prepared in August, 1984 and may have been changed with new product announcements. Call for latest prices

LATEST ISSUE REDUCTIONS!

64K MEMORY EXPANSION KITS Set of 9 chips *Guaranteed for Life*	$ 37.80*
LOTUS 1-2-3 *New Best Price!*	$270.50*
AST SIX-PACK PLUS with OK	197.00*
QUADRAM 384K QUADBOARD with OK Special Purchase While Supplies Last	185.00*
STAR MICRONICS GEMINI 15X 120 CPS Epson Compatible w/Tractor Wide Platen Epson Graphics	325.00*
TANDON TM100-2 DRIVES	153.00*
TALLGRASS TG3020	2800.00*
ORCHID BLOSSOM/64K installed *New Price! Full Six-Pack Features with networking capability!*	205.00*
PANASONIC 1/2 Height Disk Drives per pair	250.00*
AMDEK MONITORS	
V300G Composite Green	110.00*
V300A Composite Amber	120.00*
V310A IBM Amber	130.00*
HERCULES MONOCHROME CARD	298.00*
HAYES 1200B with New Smartcom II	366.90*
C. ITOH STARWRITER F10/40 40 CPS-Letter Quality Printer	875.00*
BRAND NAME DISKETTES *DS/DD Box of 10 Guaranteed for Life Not Generic*	16.00*

CALL TOLL FREE **1-800-621-S-A-V-E** (orders and memberships only)
In Illinois call (312) 280-0002 validation code A1B1

PC NETWORK

. . . WITH THESE 15 UNIQUE BENEFITS

1 COST+ 8% PRICING—The NETWORK purchases millions of dollars in merchandise each month. You benefit in receiving the lowest price available **and all at just 8% above published dealer wholesale price.**

2 OUR 400 PAGE WHOLESALE CATALOG—Members receive our 400 page wholesale catalog containing over 20,000 hardware and software products for the IBM PC, APPLE and over 50 other popular computer systems. THE NETWORK'S CATALOG IS THE LARGEST SINGLE COMPILATION OF PERSONAL COMPUTER PRODUCTS AVAILABLE TODAY.

3 IN-STOCK INSURED FAST HOME DELIVERY—The NETWORK maintains a **giant multi-million dollar inventory of most popular products,** allowing us to ship many orders from stock. Non-stock items are typically maintained in local warehouses just days away from The NETWORK and YOU. We pay all insurance expenses on your shipment. *EMERGENCY OVERNIGHT SERVICE IS AVAILABLE ON REQUEST.*

4 10 DAY RETURN POLICY—**If you are not satisfied, for any reason with any hardware component purchased from The NETWORK within 10 days of receipt, we will refund your entire purchase (less shipping) with no questions asked.**

5 MEMBERSHIP SATISFACTION GUARANTEE—If for any reason you are not satisfied with your membership within 30 days, we will refund your dues IN FULL.

6 EXPERIENCED CONSULTANTS—The NETWORK hires consultants, not order takers, to aid you in product selection. Our consulting staff possesses in excess of 150 man years of personal computer product experience. **We back our consultants with our money back guarantee: IF ANY PRODUCT RECOMMENDED BY OUR CONSULTING STAFF FAILS TO PERFORM AS PROMISED—OR IS INCOMPATIBLE WITH YOUR SYSTEM—WE WILL TAKE IT BACK AT OUR EXPENSE FOR A 100% REFUND.**

7 FREE TECHNICAL SUPPORT—The NETWORK supports every product it sells. Our qualified TECH-SUPPORT staff will help you assemble your system, interpret vendor documentation and get your software and hardware to work. **WE WILL GIVE YOU ALL THE HELP YOU NEED, WHEN YOU NEED IT—FREE!**

†8 OPTIONAL BUSINESS RENTAL LIBRARY—All members can join our BUSINESS RENTAL LIBRARY *featuring over 1000 available titles* for just $25 PER YEAR above the base membership fee. **This entitles you to rent business software AT JUST 20% of the DISCOUNTED PRICE FOR A 14 DAY PERIOD. If you decide to keep the software, the entire rental fee is deducted from the purchase price. VIP MEMBERS GET A FULL 28 DAYS for just $30 above the V.I.P. base fee. This also includes the game library privileges for a $5 combination savings.**

†9 OPTIONAL GAME SOFTWARE RENTAL LIBRARY—The Game Rental library is available to members for just $10 PER YEAR and permits evaluation (or just enjoyment) of any game or educational software product as above.

10 SPECIAL SAVINGS BULLETINS—THE PRINT-OUT—The NETWORK seeks every opportunity to save money for its members. We buy excess dealer inventories, and store bankruptcy closeouts regularly. We then turn around and make this merchandise (only top quality name brand products) available to our members at fantastic savings via THE PRINT-OUT, our newsletter and savings bulletins.

11 DISCOUNT BOOK LIBRARY—Working with numerous publishers and distributors, The NETWORK has assembled a library of over 1000 computer related books and manuals at savings of up to 75% from the normal store price.

12 MEMBERSHIP REFERRAL BONUS—Our most valuable source of new members is you! To date almost 40% of our members have been referred by word of mouth from other satisfied members. For those of you who refer new members, The NETWORK will credit a cash bonus to your account applicable to any future purchase.

13 CORPORATE ACCOUNT PROGRAM—Almost 50% of The NETWORK's members are corporate buyers and users *(see opposite page left).* The NETWORK can establish open account status and assign designated account managers to expedite orders, and coordinate multiple location shipments.

14 QUANTITY DISCOUNTS—For large corporations, clubs, and repeat or quantity buyers The NETWORK can extend additional single order discounts, when available to us from our manufacturers and distributors.

15 PRICE PROTECTION—The PC Industry is crazy!! Prices change not yearly or monthly or even weekly but often day by day! These changes are sometimes up *but are mostly down!!!* **THE NETWORK GUARANTEES THAT IN THE EVENT OF A PRODUCT PRICE REDUCTION, BETWEEN THE TIME YOU PLACE YOUR ORDER AND THE TIME THE PRODUCT SHIPS YOU WILL ONLY PAY THE LOWER AMOUNT!!**

CIRCLE 535 ON READER SERVICE CARD

staff and an in-house programming staff. He also maintains contact with free-lance systems analysts and programmers in the area. After hearing the businessman's description of how he operates, the dealer recommends a small network of PCs, a multi-user database manager, and custom programming. His consultants feel that the way the businessman ages and values his inventory cannot be handled by any of the commercial packages they've seen. Furthermore, the available packages are not adapted to multi-user access over a network.

It goes without saying that the businessman also consults with his IBM rep. After all, he's a happy customer. She reviews his needs and comes up with an all-IBM solution. She recommends the database manager in IBM's new software lineup—no custom programming.

Now the businessman is in a quandary. The IBM proposal sounds simpler, costs out lower, and appears that it might be delivered faster. Is the IBM rep right? Is the dealer right? Unfortunately, there's only one way to find out for sure. And equally unfortunately, the businessman is probably most likely to choose IBM over an independent dealer, even when he shouldn't.

If IBM can sell better than most dealers, retail stores will close. Tailored solutions will be harder to come by, and innovative products will have fewer outlets. It will hurt our industry.

Trust Me

There's another factor. IBM was recently given a clean bill of health by the U.S. Justice Department when it found longstanding antitrust charges against the company to be without merit. With this new-found freedom, though, it's just a matter of time before IBM winds up in court again. Oh, it'll take years, believe me, but it's inevitable. No company as big, aggressive, and successful as IBM can avoid it.

The next time IBM is in the dock, some of the complaints will be aimed at its attempted domination of retail distribution channels. Mail-order companies face a similar problem as IBM continues to offer more and more products through its direct-sales operation.

So do your part. Help keep IBM out of court. Patronize your local dealer, or buy something by mail. ■

RP Marketing Corp. Arvada, CO 80002 (303) 424-1546

Distributor-Direct Specials

DISKETTES

RP's 100% certified/10 year warranty

DS/DD — $29.95
Flip Box of 10
SS/DD — $24.95

IBM COMPATIBLE PC

Tava PC w/256 k, 2 drives including INTEGRATED SOFTWARE valued at $700.00... Total package only: $2,495.00 F.O.B./Denver

*IBM is a trademark of the International Business Machines Corporation MC VISA cards add 2%

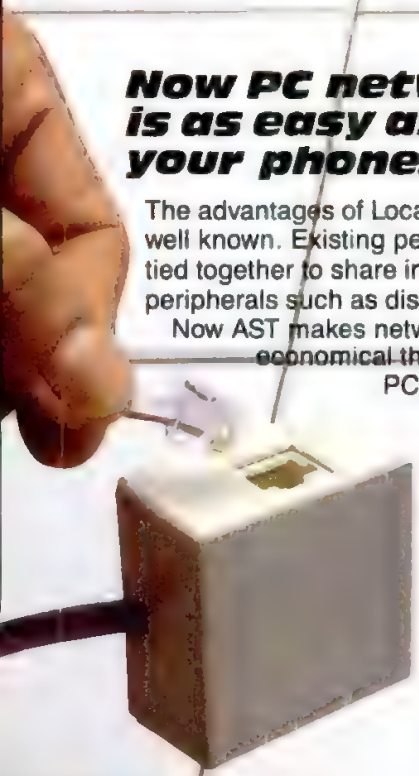
CIRCLE 396 ON READER SERVICE CARD

Introducing AST-PCnet II.

Now PC networking is as easy as plugging-in your phone.

The advantages of Local Area Networks (LANs) are well known. Existing personal computers can be tied together to share information and expensive peripherals such as disks and printers.

Now AST makes networking easier and more economical than ever before. With AST-PCnet II, you simply insert the PCnet II board into an I/O slot in your IBM PC or XT. Then connect the PCnet II "twisted-pair" cable to the main network cable using a standard modular "telephone jack."



The same kind of jack that's used on your telephone. To move your PC from one point to another on the network, simply plug in at the desired location. It's that easy.

With AST-PCnet II, anywhere from 2 to 160 PCs can be interconnected. Standard PC-DOS commands are used to access remote drives and printers. And dedicated file and print servers are not required, because shared PCs also function as standard workstations.

We're AST, the world's leader in communications and enhancement products for the IBM PC. To find out how AST-PCnet II can expand your IBM PCs and XTs into a reliable, versatile LAN, call or write AST Research, 2121 Alton Avenue, Irvine, California 92714. (714) 863-1333. TWX: 753699ASTR UR

AST RESEARCH INC.

AST PCnet II is a development of AST Research Inc. Software protocols are based on technology licensed from Orchid Technology Inc.

AST-PCnet II Local Area Network

CIRCLE 104 ON READER SERVICE CARD

Will your plug-in modem plug you in?

Pick out any plug-in modem card. Look it over. Study it. Is it truly compatible with your computer? Does it offer the features you want? Is it a good value?

Maybe not. Unless you pick the AJ Connection from Anderson Jacobson.

The AJ Connection—complete with all four comports—provides more communications capability than any other plug-in modem in its class. And it works on any IBM bus-compatible computer. IBM* PC. IBM XT. Compaq.* Columbia.* TeleVideo.* Fujitsu.* Eagle.* And more.

Your connection to the outside world.

An AJ Connection system will link your computer to data banks, mainframes, remote terminals, or other PCs. It dials up to 40-digit sequences, answers calls, and disconnects. All automatically. All from one board.

The asynchronous communications adapter that many systems don't include is standard. So you get an extra port for simultaneous recording and printing. Plus a built-in speaker. All without overlapping into adjacent expansion slots.

AJ Connection comes complete with plug-in modem, cabling, software, and full documentation.

See us at COMDEX/FALL '84.
Nov. 14 - 18.
Booth 2124.

Powerful software.

Crosstalk™ XVI auto-dial software lets you program up to 40 function keys for quick log-on to remote systems. It displays transmittal times, disk space, and other necessary data. Lets your system password-protect your data. It even allows terminal emulation.

Best of all, Crosstalk is easy to use. You simply follow the menus and prompts.

Ask your computer dealer to plug you into the AJ Connection. The latest in a long line of reliable communications solutions from AJ.

Or call us direct. Anderson Jacobson, Inc., 521 Charcot Avenue, San Jose, California 95131. Regional offices: Chicago, IL (312) 671-7155; Fair Lawn, NJ (201) 794-9316; San Jose, CA (408) 263-8520. Dealer inquiries welcome.

ANDERSON JACOBSON

CIRCLE 126 ON READER SERVICE CARD

*Trademark

Having problems with retrieval?

You need software insurance.

Diskettes are fragile, and when a protected program is damaged, the results are expensive and inconvenient. If you have a backup diskette, though, you can have your Apple, IBM or compatible computer back on line within seconds . . . affordably. That's software insurance.

Copy II Plus (Apple][,][Plus, //e)

This is the most widely used backup program for the Apple. Rated as "one of the best software buys of the year" by **InCider** magazine, its simple menu puts nearly every disk command at your fingertips. The manual, with more than 70 pages, describes protection schemes, and our **Backup Book**™ lists simple instructions for backing up over 300 popular programs. A new version is now available that is easier to use and more powerful than before. Best of all, Copy II Plus is still only $39.95.

WildCard 2 (Apple][,][Plus, //e)

Designed by us and produced by Eastside Software, WildCard 2 is the easiest-to-use, most reliable card available. Making backups of your total load software can be as easy as pressing the button, inserting a blank disk and hitting the return key twice. WildCard 2 copies 48K, 64K and 128K software, and, unlike other cards, is always ready to go. No preloading software into the card or special, preformatted diskettes are required. Your backups can be run with or without the card in place and can be transferred to hard disks. **$139.95** complete.

Important Notice: These products are provided for the purpose of enabling you to make archival copies only. Under the Copyright Law, you, as the owner of a computer program, are entitled to make a new copy for archival purposes only, and these products will enable you to do so.

These products are supplied for no other purpose and you are not permitted to utilize them for any use, other than that specified.

CIRCLE 112 ON READER SERVICE CARD

Copy II PC (IBM)

This is **THE** disk backup program for the IBM PC and PC/XT that backs up almost anything. Others may make similar claims, but in reality, nothing out performs Copy II PC . . . at any price. Copy II PC even includes a disk speed check and is another "best buy" at only **$39.95.**

We are the backup professionals. Instead of diluting our efforts in creating a wide variety of programs, we specialize in offering the very best in backup products. So, protect your software investment, **before** your software meets its master.

CENTRAL POINT Software, Inc.

The Backup Professionals

To order, call 503/244-5782, 8:00-5:30 Mon.-Fri., or send your order to: Central Point Software, 9700 SW Capitol Hwy, Suite 100, Portland, OR 97219. **Prepayment is required. Please include $3 for shipping and handling ($8** outside U.S. or Canada). **Welcome**

THE PANASONIC® SR. PARTNER™ NO PERIPHERALS NEEDED

Because they're already built-in. The 80/132-column printer. The 9-inch, high-resolution display. There's even a built-in 360K disk drive. Which all make the Sr. Partner a complete computer as is.

The Sr. Partner is IBM hardware and software compatible so you can run popular business programs immediately. The software bundle currently offered with the Sr. Partner is WordStar, VisiCalc, pfs Graph, File, Report, MS-DOS 2.11 and GW BASIC.*

And with its 256K internal memory expandable to 512K, the Sr. Partner can run the new integrated software.

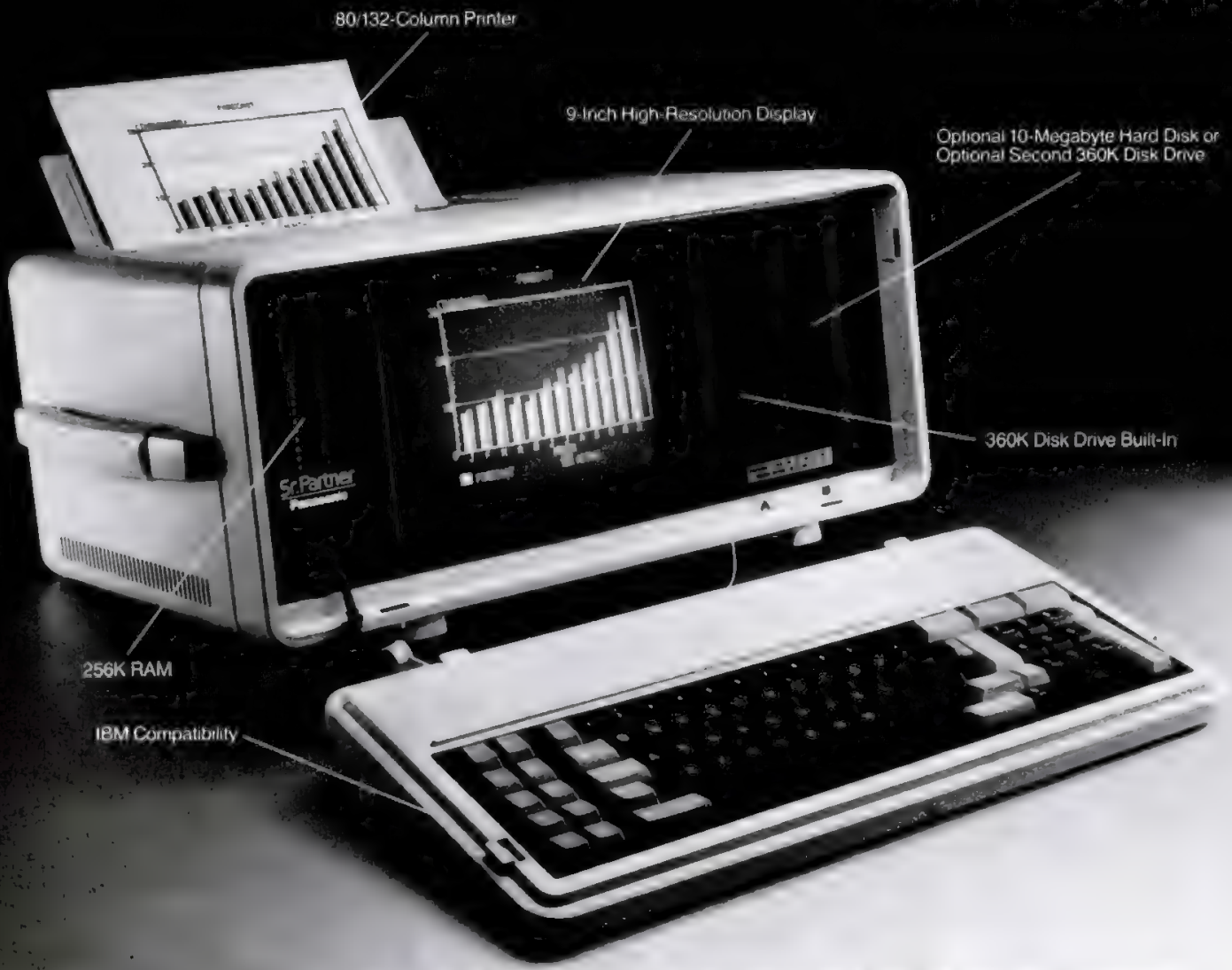
Built-ins also include expansion slots and parallel and serial I/O ports. There's even a built-in RGB monitor port so you can take advantage of the Sr. Partner's color and graphics capability.

If you want 10 megabytes of storage, choose the new hard disk Sr. Partner.

Both the Sr. Partner and the hard disk Sr. Partner come with an exceptional Panasonic warranty.**

For the dealers nearest you, call: 201-392-4261. The Panasonic Sr. Partner. No peripherals needed. It makes the competition look like Jr. Executives.

Panasonic
Industrial Company



*Software bundle offer subject to change or withdrawal at any time without notice. **One-year limited warranty. 6 months on thermal printer head. Carry-in or mail-in service.
Sr. Partner is a trademark of Matsushita Electric Industrial Company Ltd. WordStar is the trademark of MicroPro International Corporation. VisiCalc is the registered trademark of VisiCorp (Software Arts, Inc.). pfs Graph, File, Report are the registered trademarks of Software Publishing Corporation. GW BASIC, MS-DOS are the trademarks of Microsoft Corporation.

CIRCLE 177 ON READER SERVICE CARD

Training on a Chip

Today the training environment and the work environment are becoming one. With embedded training and job aids, you learn how to do your job from a chip in your machine.

Embedded training is a new name for an old concept: on-the-job training.

Industrial designers are now embedding training, via the ubiquitous chip, into machines people use to do their jobs—from computers to X-ray machines to tractors. The chip is programmed to teach you how to use a device and gives you easy ways to get help when you run into trouble. Diagnostic routines pinpoint the exact sources of trouble in case of a malfunction. Instructional routines can tell the repairperson or even the user exactly what to do. Training that once took lots of time and skilled people now takes little time and even less skill.

Remember what training was like B.C.—Before the Chip? If you wanted to become a typist, machine operator, or credit analyst, for example, you attended a school or training program. You usually learned much that you would never use on the job. You didn't learn certain things that you did need, but eventually discovered these things on your own or from fellow workers.

This system worked as long as people went on doing the same thing year after year. But today the pace of job change has accelerated. You can no longer use the same skills year after year. The old ways no longer work. Embedded training has turned out to be the solution.

Not limited to routine clerical jobs, embedded training can also work with jobs that require high levels of problem-solving and decision-making skills. For example, a bank employee who must make a credit recommendation based on all the information he or she can gather about an applicant's credit status is now prompted on a computer screen with the proper questions to ask. The information is analyzed as soon as it is entered, and the next bit of data that is required is called for on the screen. Except in special cases, by the time all the data are entered, the decision to grant or withhold credit should be nearly automatic.

Norman D. Kurland

Embedded job aids are making jobs easier, increasing worker productivity, and reducing errors. Used wisely, they can also expand the scope of demanding but not very challenging or creative jobs. On the other hand, embedded training could make some jobs more routine and undemanding. Someone who formerly needed exacting skills may now need only follow instructions.

A Question of Cost

Of course, nothing inherent in embedded job aids requires designers to use them to reduce the quality and value of the human contribution. However, if the cost of producing and using a job aid is less than the cost of training and employing a more highly skilled worker, firms may be tempted to choose the aid rather than the skilled worker. In doing so they may lose the human qualities that no aid can replace—adaptability, creativity, flexibility, and willingness to make the extra effort—often the keys to greater productivity. The challenge in job design is to use embedded training and job aids as tools *for* people, rather than *instead* of people. ■

Norman D. Kurland is a consultant in education and telecommunications. He is currently doing a study of the ways in which technology is changing the education and training of workers.

AT&T AND IBM MAKE GREAT COMPUTERS

CIA IMPROVES THEM

WE TAKE OVER WHERE THEY LEAVE OFF

With a full line of internal and external hard disk drives in a wide range of storage capacities to suit your needs. As well as a newly introduced 3.3 megabyte floppy disk subsystem. All designed to provide fast, reliable storage for the AT&T PC, IBM PC and compatibles. Convert your IBM PC or compatible into an XT with our subsystems—all at the lowest prices anywhere.

10 MB Hard Disk Subsystem
Internal $ 885.00
External $1,265.00

10 MB Hard Disk Subsystem with a 3.3 MB Floppy Disk Drive External $1,995.00

20 and 40 MB Hard Disk Subsystems, internal or external mounts, with or without 3.3 MB Floppy Disk Drive also available.

WE GIVE REAL MEANING TO THE WORDS "VALUE ADDED"

We don't stop at providing solutions to your mass storage problems, CIA can solve all your business computing needs.

As an approved AT&T Value Added Reseller with years of experience in turnkey systems, CIA brings you the full line of AT&T computers—from the PC 6300 running all the popular IBM compatible software under MS-DOS,* to the 3B family of Unix* based multi-user computers with customized software to meet your needs. We also have the PC 6300 in a multi-user, multi-tasking system running Xenix* and MS-DOS.

Before you spend more, call the source for all your business computing solutions.

CIA

450 E. Kennedy Blvd.
Lakewood, NJ 08701
(201) 370-3900

CIRCLE 229 ON READER SERVICE CARD

*Trademarks

Letters to PC

Version Number Problems

I read Alfred Poor's review of the *Crosstalk XVI* communications program with interest ("Take Your Choice: Two Communications Packages," *PC*, Volume 3 Number 12). I am glad to see a commercially available program that has, at least as an option, a file transfer protocol compatible with other communications programs. I am, of course, referring to the XMODEM protocol, which has become the de facto standard among users of the various public-domain computer bulletin boards.

I did have a slight problem purchasing a copy of *Crosstalk XVI* that would use the XMODEM protocol. After contacting Microstuf, I found out that only Version 3.4 and subsequent versions have XMODEM capabilities. Poor's article did not mention which version he reviewed, and apparently some stores are still selling older versions. Since there are considerable expenses and inconveniences incurred when getting an update of a software package (software updates are generally sent to registered users at no cost, but you must pay for an updated manual), you should warn your readers to check the version number of the program they are buying. As a computer consultant, I recommend that my clients try to obtain the latest version of any software they purchase. And I always suggest they get this information from a source other than the store where the purchase will be made.

John F. Belsher
Placentia, California

More Words on Word Processing

Thank you very much for the word processing summary ("The Word on Word Processors," *PC*, Volume 3 Number 17). It was easy to read and very well done, considering the problems you have discussed regarding putting an issue to bed. The article particularly came in handy for a course on word processing that I am preparing to teach.

There is one critique I'd like to make. I use *WordStar* extensively, and I felt that your screen shot for *WordStar* did that excellent program a disservice. For the

other programs you showed a tight screen display with all bells and whistles visible. But for *WordStar* you double-spaced the text and left off most of the editing aids, such as the ruler line. The result was terrible and did not do the program justice.

Thomas E. Simondi
Los Angeles, California

Your review of word processing programs was the best comprehensive review I have ever seen. There were many features that our legal department would have liked to have seen included. For example, if a computer has two different printers attached to it, can the program send to one or the other without reconfiguring? Can the program automatically renumber paragraphs? Does the program highlight before and after the text is entered? Another important feature of the program is the helpfulness of the manufacturer to the end user; does it have a toll-free number?

PC Magazine is the best magazine of its kind, and I am eagerly awaiting for the start of my subscription.

Jeffrey A. Smoley
Miami, Florida

One of the most valuable features of *MultiMate* is its ability to edit other documents while printing. In the article "The Word on Word Processors," the chart on page 141 claims that this can't be done.

This is true only if the Foreground mode (F) is selected on the print-document screen. If the Background mode (B) is selected, *MultiMate* will enable editing of other documents. *MultiMate* also provides a queue for documents waiting to be printed and an option to delay a document until a specified time —even a future day—just as long as the program keeps going.

Todd Lindberg
Scottsdale, Arizona

Krasnoff Kudos and Criticism

Bravo to Barbara Krasnoff! Not only has she uplifted *PC* with an unusual and non-pompous editorial ("Consumer Guinea Pigs," *PC*, Volume 3 Number 17), but in the same issue she also introduced a useful format for comparing application programs ("The Word on Word Processors"). I even think that her editorial understated how widespread the practice is of dumping the costs of software development onto the user.

Regarding the word processor comparisons, I think that allowing so many reviewers such wide latitude leads to some erroneous conclusions owing to their unequal criteria. For example, the chart shows that Microsoft's *Word* hyphenates, while *XyWrite* does not. My copy of *XyWrite* does indeed hyphenate, using - and -, in much the same way that

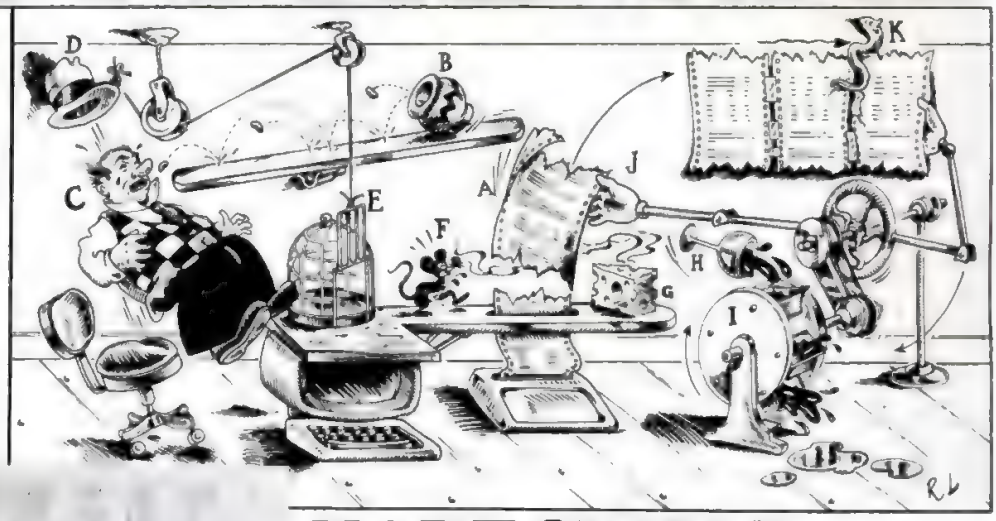
SIMPLIFIED SPREADSHEET ASSEMBLY

RISING SPREADSHEET (A) KNOCKS MEXICAN JUMPING BEANS (B) INTO MOUTH OF NEUROTIC MAN (C) WHO IS SO DISCOMBOBULATED THAT HIS HAIR STANDS ON END, DISLODGING HAT (D) WHICH OPENS CAGE (E) AND RELEASES EPICUREAN MOUSE (F).

MOUSE, INSPIRED BY SCENT OF PERFECTLY AGED CAMEMBERT CHEESE, GNAWS THROUGH SPREADSHEET, ONLY TO DISCOVER HE HAS BEEN FOOLED BY AROMA OF OVER-RIPE GORGONZOLA (G)

IN A FIT OF PIQUE HE SPILLS VINTAGE WINE (H) INTO WATER-WHEEL (I) WHICH TURNS PULLEY THAT CAUSES GLOVE (J) TO GRASP SPREADSHEET AND MOVE IT TO TAPING AREA.

SHEET IS TAPED SECURELY IN PLACE BY TRAINED ADHESIVE TAPE WORM (K).



MADE SIMPLE.

Now you can save time, aggravation, adhesive tape, and Gorgonzola cheese by following one simple direction—Sideways. It's the unique software program that lets you output all the spreadsheet columns you need, all on one continuous page, all with one print command—and all for only $60!

With Sideways on your side, no spreadsheet you invent with Lotus 1-2-3,™ VisiCalc,® Multiplan,™ or SuperCalc™ is too wide! And it's just as powerful an ally when you're creating far-into-the-future schedules and pert charts with your word processor. In fact, for any wide text file, for dozens of uses, the way to go is Sideways.

The experts agree. *PC* Magazine, for example, writes: "If you've got the need, Sideways has the solution." And *PC World* calls Sideways "nifty . . . . an easy to use program that does what it claims."

You can go Sideways today with an IBM® PC and an IBM,® Epson, Okidata, Prism,™ or Prowriter™ printer. Ask for Sideways at your local ComputerLand® or other leading computer stores. Or mail a $60 check to Funk Software, P.O. Box 1290, Cambridge, MA 02238. (617) 497-6339. MC/Visa accepted. Send no Mexican jumping beans, please.

SIDEWAYS™
FOR EASY-READING HARD COPY

CIRCLE 306 ON READER SERVICE CARD

Word does, though *Word* uses different characters. I guess this error is a product of the reviewer's passions, and word processors do stir passions.

Again, kudos to Krasnoff.

Robert L. Woods
Claremont, California

I picked up the September 4 issue of *PC* from the newsstand to read the word processor comparison, and I noticed Barbara Krasnoff's article "Consumer Guinea Pigs." She deserves a raise—to identify a problem is one thing, but to be honest and print it is another thing. I admired her article—she is correct, and I am grateful to *PC* for running it.

Darrell F. Bennett
San Luis Obispo, California

"Consumer Guinea Pigs," by Barbara Krasnoff, had many points that were well taken, but a few that were misguided. Her thesis is that software publishers are wrong to let the consumer or magazine reviewers debug its packages. Like Krasnoff, I recognize that publishers cannot find all the bugs before the first package leaves the production line. However, she also states that the producers do not have the courtesy of receiving prepublication copies of the product reviews. That viewpoint represents the same philosophy she attributes to the software companies themselves.

Product reviewers have been given special privileges for the mutual benefit of both the magazine and the manufacturer. One needs copy to fill in the spaces between the paid advertisements; the other needs published critiques to increase consumer interest. This is fine. But to hold back, for any length of time, any information that would provide product improvement for the end user, in the name of writer integrity, is a sign of false superiority.

I totally agree that reviewers should not submit copy to the manufacturer for editing, but they should submit copy if it will result in quicker action from the manufacturer. The time between when an article is written and when it is published, by your own admission, can be months. If you would provide the manufacturer with a prepublication copy of a review, you could speed up future enhancements to products by that same period of time. The only question of integrity is that of conflict of interest on the reviewer's part. Unfortunately, Krasnoff comes close to the line when she suggests that a suitable response to being asked by the manufacturer for a prepublication copy of the review would be "What will you pay me for the service?"

In summary, we all agree that a perfect program is what we want. None of us expects such a product early in its lifetime. The market pressure created by the manufacturers and the consumers will not allow that luxury.

Anything a reviewer can do to increase the value of the product to the reader and potential consumer is positive. Anything less is a disservice to the audience a magazine serves.

Bill Accola
Moscow, Idaho

I am writing in response to Barbara Krasnoff's sanctimonious editorial ("Consumer Guinea Pigs") about the software industry's practice of using the paying public to debug its products. I want to say flatly and unequivocally that we not only expect our customers to debug our software, but we expect them to help us design it as well. Those of us with many years of experience in the industry know that the best software is designed through a symbiotic relationship between the customer and the developer. I think you do your readers, especially those new to computers, a great disservice by leading them to believe that software is simply a product like toothpaste or toilet paper.

A customer has no more right to expect a perfect software product than he has to expect a perfect film or novel or symphony (no pun intended). What the customer can expect is service. He can expect that he has gotten the programmer's best effort and that it has been thoroughly tested. He can expect to be notified of any bugs and be sent the corrections. He can expect to have his questions answered and most of all he can expect to have the software developer take his problems seriously and design future software to solve these problems. Good software is a constantly evolving enterprise, and the customer has an essential role to play in the process.

We not only expect our customers to debug our software, but we expect them to help design it.

It is absolutely impossible to subject a complex piece of software to all the conditions that users will subject it to. Beta testing, while good in theory, is never adequate.

I do not find it unreasonable for a vendor to want the reviewer to help him improve his software. One would assume that a reviewer, particularly a paid reviewer, would be an especially knowledgeable user. Unfortunately, this is rarely the case. It is equally understandable that the vendor would like to check a review for accuracy as well. I have seen gross errors in reviews, both for and against products. Just a bit of editorial checking would have resulted in a far better review. I only wish that reviews were as error free as the software they discuss.

Victor Rosenberg
Ann Arbor, Michigan

Simultaneous Display

Is it possible to operate both an IBM or compatible A/N card with one screen and an IBM or compatible color graphics

COHERENT™ IS SUPERIOR TO UNIX* AND IT'S AVAILABLE TODAY ON THE IBM PC.

Mark Williams Company hasn't just taken a mini-computer operating system, like UNIX, and ported it to the PC. We wrote COHERENT ourselves. We were able to bring UNIX capability to the PC with the PC in mind, making it the most efficient personal computer work station available at an unbelievable price.

For the first time you get a multi-user, multitasking operating system on your IBM PC. Because COHERENT is UNIX-compatible, UNIX software will run on the PC under COHERENT.

The software system includes a C-compiler and over 100 utilities, all for $500. Similar environments cost thousands more.

COHERENT on the IBM PC requires a hard disk and 256K memory. It's available on the IBM XT, and Tecmar, Davong and Corvus hard disks.

Available now. For additional information, call or write,

Mark Williams Company
1430 West Wrightwood, Chicago, Illinois 60614
312/472-6659

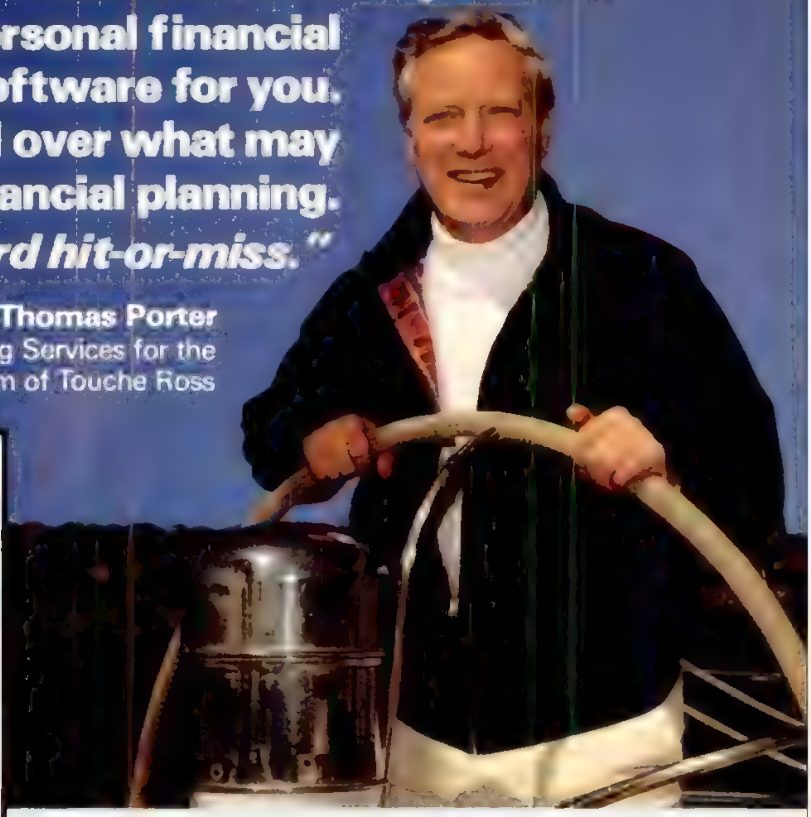
COHERENT is a trademark of Mark Williams Company.
*UNIX is as trademark of Bell Laboratories.

CIRCLE 391 ON READER SERVICE CARD

"If you make more than $35,000 a year. . .

Lumen has designed personal financial planning and management software for you. It can help you gain control over what may have been hit-or-miss financial planning. *These days you can't afford hit-or-miss."*

—W. Thomas Porter
Director of Personal Financial Planning Services for the Big-8 Accounting firm of Touche Ross



"When I wrote a best-selling book on personal financial planning and management, I wanted to provide a complete structure men and women like you could use to gain total control over their own financial affairs. Now Lumen has transformed the financial planning and management methods revealed in my book into two easy-to-run software packages for the IBM-PC*."

The Personal Financial Planner

1. **Net Worth Statement:** Calculated for you instantly.
2. **Income and Expenditure Ratios:** Are you within safe limits? Your Planner will tell you.
3. **Investment Analysis and Strategies:** Based on your own financial circumstances.
4. **Tax Planning:** The Planner helps you maximize benefits and minimize tax exposure.
5. **Retirement Planning:** Find out what you should be doing now to make your retirement dreams come true.
6. **Estate Planning:** The most important facet of personal financial planning becomes a breeze.
7. **Education Financing:** You have four children, ages 6, 9, 12, and 15. How much should you be setting aside now for their education?
8. **Insurance Analysis:** Are you overinsured? Underinsured? Do you have the right kind of coverage? The Planner will tell you.
9. **Personal Data:** Up-to-the minute personal financial data at the push of a button.

The Personal Financial Manager

1. **Checking Accounting Management:** Provides instant checkbook balancing—absolutely accurate.
2. **Credit Card Accounts:** No more racking your brains when an incorrect bill comes in.
3. **Assets / Liabilities:** You'll know instantly what you owe and what you own. Changes take only a few seconds.
4. **Budget Tracking:** Are you on budget? Over budget? Under budget? Find out what you need to do to stay on target.
5. **Check Printing:** The Manager can actually write your checks for you. And your balance adjusts automatically.
6. **Double Entry Bookkeeping:** The Manager sets up double entry books for you automatically.
7. **Account Status:** You get a complete series of 170 pre-defined accounts. No time wasted setting up your own.
8. **Tax Reports and Codes:** All your tax records kept in perfect order. You can do your income taxes during halftime of the Rose Bowl.
9. **Transaction Maintenance:** Income from all sources and expenses to all sources are orderly and balanced. Pull a report whenever you want or need one.

Lumen software is exclusively represented by
Prentice-Hall, Inc.
Business and Professional Division
Englewood Cliffs, New Jersey 07632

© 1984 **Prentice-Hall, Inc.**

* IBM-PC is a registered trademark of International Business Machines Corporation.

LUMEN

Lumen Systems, Inc. T.M.
The Brightest Name in Software

Instant $20 Rebate

Ask for our Instant $20 Rebate Certificate at any Authorized Lumen Dealer. It is worth $20 when presented as partial payment for either the Personal Financial Planner or the Personal Financial Manager. For more information, or the name of the Authorized Lumen Dealer nearest you, *call toll free* **800-624-0023** (in NJ call **800-624-0024**). Offer expires October 31, 1984.

CIRCLE 309 ON READER SERVICE CARD

Run Lotus from your hard-disk

HardRunner™ allows you to run Lotus™ 1-2-3™ and Symphony™ from your hard-disk without putting your Lotus System Disk in Drive A.

HardRunner is a self-installing utility program that allows you to run Lotus 1-2-3 (version 1A) and Symphony (version 1.0) right off your hard-disk! HardRunner lets you use your hard-disk system the way it was designed to be used!

HardRunner makes absolutely no alterations to your Lotus or Symphony programs. Quit worrying about losing or destroying your System Program Diskettes. Avoid the hassle of placing a Diskette in Drive A in order to run a program that already resides on your hard disk. So order HardRunner today and put your System Program Diskette safely away.

HardRunner works with the IBM® PC, XT and AT, true compatibles, and the TI™ Professional. PC or MS DOS version 2.0 or higher is required.

So run with the Best! Run with HardRunner! 24 hour Toll Free **1-800-453-5433.** In Utah call 1-800-662-2500.

Please send me your new HardRunner hard-disk utility. **$29.95**
($29.95 plus $5.00 shipping and handling)
Utah residents add 5¾ % sales tax.

Name _____

Address _____

City _____

State _____ Zip _____

Enclose check, money order or VISA/Mastercharge # _____

Nostradamus, P.O. Box 3167, Ogden, Utah 84102

CIRCLE 268 ON READER SERVICE CARD

LETTERS TO PC

card with a different screen? I have done some limited investigation myself, but I have not been able to determine whether or not this is true.

Also, is it true that it is possible to display alphanumerics on one screen while displaying graphical information on the other? If so, are there any special requirements?

R.M. Emberson, Jr.
Palo Alto, California

'Tis true! Many PC users have both types of display cards (with monitors) attached to their PCs, and at least one display card, the Paradise MultiDisplay, supports both types of screens. A simultaneous display of graphics and text is supported by Lotus's 1-2-3 *and* Symphony, *and other programs can do it too. Simultaneous displays of different text on each screen is also possible. Watch for an upcoming article in* PC *on how you can display data on both screens.—Ed.*

DisplayWrite 2 for Me

I enjoyed reading "IBM's Displaywriter Begets a Family of PC Software" (*PC*, Volume 3 Number 18). I have now decided that *DisplayWrite 2* is the word processing program for me. Just as soon as IBM sells all the printers it can to users who will buy a printer just to run the program and then releases the version that will work with my Diablo 630, I am going to buy it.

Alexander V. Pinter
Columbus, Georgia

Custom Tailoring Your Screen

I've just taken up reading *PC Magazine* again and have noticed some important improvements in the last few issues. Now I'm planning to stop my subscription to *PC World* and start one to *PC*.

I was prompted to write this letter after reading a letter from Benjamin Sasso, "Clocking the PC" (*PC*, Volume 3 Number 15, page 94), in which he responds to information on changing your prompt.

(continued)

How you like your prompt and screen to appear is definitely a matter of personal preference. Since I don't like how the time shows up floating over in the corner in Sasso's example, I'd like to share my method with other readers.

On a color monitor, you have much more leeway to set apart your clock. I put the date and time on the first line and let the default drive prompt me below. To distinguish the prompt from the rest of the screen, I set the prompts to red on white, while the rest of the screen is white on blue. To get this, I enter:

```
PROMPT $e[s$e[H$e[31;47m$d -
$t $e[u$n$g$e[37;44m
```

Of course, the color commands don't work on a monochrome monitor, so I set my top line apart by putting dots out from my date and time display with the prompt:

```
PROMPT $e[s$e[H$d - $t.....
....$e[u$n$g
```

As Sasso's letter also said, you must have a "DEVICE=ANSI.SYS" line in your CONFIG.SYS file.

Fred Vinson
Washington, D.C.

As the Database Turns

I got a big kick out of the sample names of employees chosen for "Project: Database" (*PC*, Volume 3 Numbers 11–17).

My husband, who is not into computers but is an avid fan of "Days of Our Lives," was glad to find out that the magazine I spend so much time with has a sense of humor.

Kathleen Beckett
Tujunga, California

Are the editors at *PC* aware that their writers are watching the popular soap opera "Days of Our Lives?" I am referring to the employee names chosen to illustrate database functions in your recent series, "Project: Database." Now, I don't mean to be a snitch, but honestly—how can you expect PC users to take you guys

HEADACHE #43:

"There has to be a way to keep track of overdue accounts!"

Remedy: InfoTeam Accountant

The InfoTeam Accountant offers quick relief . . . it tells you who's paying on time, who's delinquent, and gives you an electronic mail link to expedite collection notices.

IBM-PC Accounting Software

The InfoTeam Accountant includes InfoGeneral Ledger, a fully featured general ledger, budgeting, and financial reporting system; InfoAccounts Receivable, the system that manages all your customer accounts, prints invoices and prepares customer statements; InfoAccounts Payable, the system that maintains vendor purchases, provides computerized checkwriting, and calculates discounts; and InfoPost, the unique electronic mailing system that sends letters for 26 cents including the postage.

A New Era in Software Integration

InfoTeam Accountant lets you use data from your accounting system in other programs. For instance, with your InfoAccounts Receivable, you can send your customer statements electronically to your accounts having past due balances. And, with just a few keystrokes, you can move information into a letter you typed on WordStar and send out those letters using InfoPost. Imagine, sending out 200 collection letters in less than 60 minutes.

The InfoTeam Accountant is part of an integrated family of productivity and accounting software. It can exchange data with other software packages (i.e. Lotus 1-2-3, VisiCalc, WordStar), and it's available in single and multi-user versions. Also, each program has built-in help screens, hard disk and floppy disk compatibility, and capacity which is limited only by disk storage space.

Your Benefits

InfoTeam helps improve your cash flow, eliminates paperwork, pinpoints profitable and non-profitable areas, saves money by eliminating bookkeeping services, and speeds up collections.

Backed by Accounting Experts

Developed by Info Designs, an industry leader, now supporting over 120,000 accounting users world-wide. Find out how InfoTeam can benefit your business . . . send us your business card or letterhead for our 48-page booklet "How to Select the Right Software".

Now available for IBM-PC, Compaq, PC-compatibles, and many multi-user systems.

InfoDesigns™

The business software worth buying a computer for

Info Designs, Inc. • 445 Enterprise Court • Bloomfield Hills, MI 48013
Call **1-800-445-INFO** for the dealer nearest you.
In Michigan call **(313) 334-9790**

Dealer inquiries invited

CIRCLE 199 ON READER SERVICE CARD

(Formerly Warehouse Software) **Call for programs not listed**

Technical & Other Information (602) 246-2222
TOLL-FREE ORDER LINE 1-(800) 421-3135

FREE SOFTWARE! FREE SOFTWARE! FREE SOFTWARE!
Purchase an Okidata, Epson, or Gemini printer and receive at no charge a program to set print characteristics and to make your computer function as a correcting typewriter. Retail value $50. Available for most disk formats.

DATA BASE MANAGEMENT SYSTEMS
Fox and Geller Quickcode $149
Knowledgeman $275
Condor III $315
NWA Statpak $285
Tim IV $249
Infostar $249
FRIDAY $165
Personal Pearl $215
Fast Facts for IBM PC $135
RBase 4000 ..... $269
CLOUT $119

WORD PROCESSING
Wordstar, Mail Merge, Correct Star, Star Index ..... Call
Wordstar ..... Call
Leading Edge Word Processor with Merge $95
Mail Merge or Correct Star $130
Microsoft Word With Mouse $284
Word Perfect $248
Volkswriter for the IBM PC $110
Volkswriter DeLuxe $155
Wang Spellchecker $36
Metasoft Benchmark $265
Multimate $249
Peachtext 5000 ..... $185

SPREADSHEETS
Calcstar $99
Supercalc II $145
Supercalc III $195
Microsoft Multiplan $119
ITK Solver $259

ACCOUNTING
TCS. equivalent of Peachtree - Specialty augmented by Warehouse Software. Customized for your IBM PC Terminal and Printer - GL, AR, PA, AP, CP/M-80, CP/M-86 for PC XT, DOS 1.1, 2.0. Each Module ..... $65 For All Four $249

CYMA ..... Call
Dollars & $ence $95
MBSI Real World, GL, PA, AP, AR Each Module $350

TRANSFER PROGRAMS
Hayes Smartcom $88
Move-It $78
Microstuff Crosstalk $95

BEST PRICE IN U.S. FOR IBM PC OR CLONES
Multifunction Board - Includes Async Adapter, Parallel Adapter, Clock with battery back-up and Software, 64K memory expandable to 512K. 1 year warranty $249

LANGUAGES
Lifeboat Lattice C Compiler $295
Microsoft C Compiler $315
Microsoft Pascal Compiler $215
Microsoft Basic Compiler $245
Microsoft Basic Language $235
CBASIC 86 for IBM PC $135
CP/M-86 for IBM PC $37
Concurrent CP/M 86 ..... $160

FOR PC DOS
Norton Utilities $48
Copy II PC $34
Prokey V3.0 ..... $79
Harvard Project Manager $225
Microsoft Flight Simulator $32

HARDWARE
Hayes 1200 Modem $485
Hayes 1200b Modem for IBM PC $415
Internal Modem for IBM PC 1200B $285
Anchor Signalman 1200 baud Modem $240
CDC 360K Disk Drives $199
1/2 Height Panasonic Drives D/S D/D $185
10 MB Sigma hard drive for the PC $895
30 MB External Hard Drive for IBM PC $1795
10 MB Datamac external hard drive for IBM PC $995
Princeton RGB monitor $469
Taxan RGB Vision 420 425

COMPUTERS
Corona Computer ..... Call
Televideo Portable - IBM PC Compatible with Software $1795

BOARDS FOR THE IBM PC OR LOOKALIKES
Quadram Color I $199
Quadram Color II $245
Plantronics Color Plus Board $365
256K Sigma Ram Board $299
Maynard Sandstar Controller $195
STB Graphics II Board $340
Tecmar Graphics Master $495
New Quadram Multifunction Board ..... Call

PRINTERS
Gemini 10X $265
Gemini 15X $365
Okidata 82A, 83A, 92P, 93P ..... Call
Okidata 84P $895
Juki 6100 ..... $409
Call on all Epson Models
Daisywriter 2000 ..... $975
Silver-Reed ..... Call
Diablo 620 ..... Call
Diablo 630 ..... Call
NEC 3550 ..... Call

TERMS: Prices include 3% cash discount. Add 3% for charge orders. Shipping on most items $3.00. AZ orders +6% Sales Tax. Prices subject to change.

TOLL-FREE ORDER LINE 1-(800)-421-3135
WAREHOUSE DATA PRODUCTS
2701 West Glendale Ave., Suite 6
Phoenix, AZ 85021

LETTERS TO PC

seriously if your staff is huddled around the old tube watching soaps in the afternoon?

Oh, by the way, does anyone at *PC* know whatever happened to David Banning? I missed that episode.

Maya Bohnhoff
Grass Valley, California

The employees' names for the database project were taken from an example given in one of the database packages that wasn't reviewed. As for David Banning, why, he's here working at PC.*—Ed.*

Where Are They Now?

I would like to locate the manufacturer of the Keyport 300, the touch tablet that was described in PC News ("Keypads as Much Fun as Compatibles at CES," *PC*, Volume 3 Number 15, page 49). Thank you for your help.

Frank J. Mihm
Aptos, California

The manufacturer of the Keyport 300 is Polytel Computer Product Corporation, and its address is 1250 Oakmead Pkwy., Suite 310, Sunnyvale, CA 94086, (800) 331-4411, (408) 730-1347.—Ed.

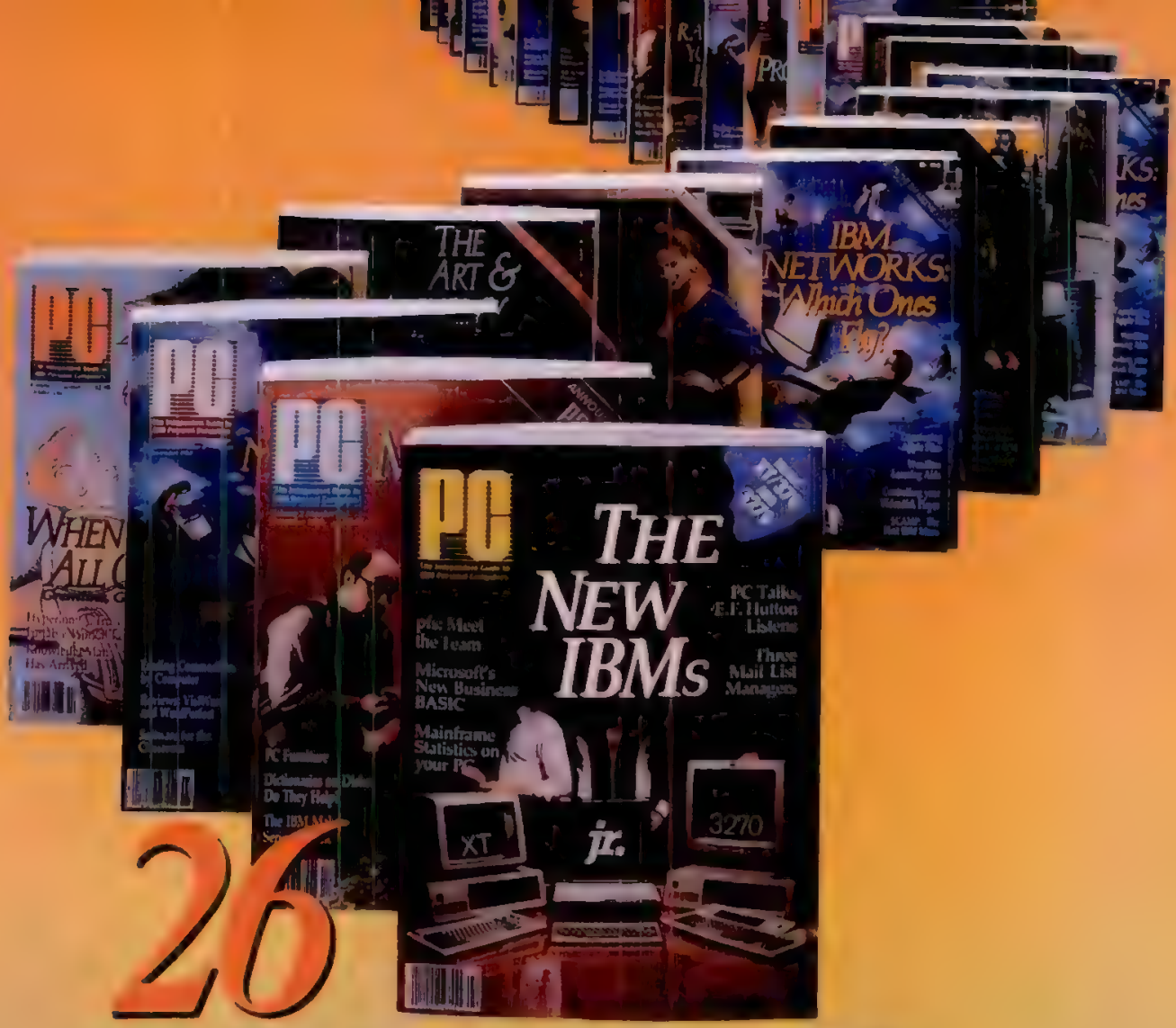
Correction:

The telephone number of Beaman Porter, Inc., was printed incorrectly in the review of its *PowerText* software ("Creative Formats for Creative Writers," *PC*, Volume 3 Number 18). The correct number is (914) 967-3504.

How to Write to PC

Do you have a comment, compliment, or criticism about something you read in *PC*? A question you'd like to open up to other readers? Send it to "Letters to PC," *PC Magazine*, One Park Avenue, New York, NY 10016. We are not able to answer letters personally.

All letters become property of *PC Magazine* and may be subject to editing. We cannot print letters that do not include a name and address.



26 REASONS TO SUBSCRIBE TO PC

...because PC goes on-sale every-other-Tuesday, bringing you the latest innovations and applications as they *happen*!

When you subscribe to PC, you'll receive the most up-to-date facts and technological breakthroughs that affect your PC, every-other-week! YES! PC will be delivered to your door at unbelievable savings!

You'll begin to develop a library of professional insights including the latest coverage of newly released hardware and peripherals. You'll find timely information on innovations in programming, applications and networking. You'll communicate with professional users like yourself and get reviews of new software packages, some before they even hit the shelves!

You can subscribe to PC, The Independent Guide to IBM Personal Computers for as little as 84¢ an issue! Use the attached coupon at right TO SUBSCRIBE TODAY!

GET THE MOST UP-TO-DATE INFORMATION FOR YOU AND YOUR PC EVERY-OTHER-WEEK, WITH *PC!*

26 SUBSCRIBE TO PC 26

P.O. BOX 2443 • BOULDER, CO 80322

YES, Please enter my subscription to *PC* for:

☐ 20 issues plus 4 bonus issues for $21.97....LESS THAN 92¢ A COPY!

☐ 40 issues plus 8 bonus issues for $39.97....LESS THAN 84¢ A COPY!

Full one-year subscription price $34.97. Single copy price $2.50.

Mr./Mrs./Ms._____
please print name in full

Company_____

Address_____

City_____ State_____ Zip_____

Check one: ☐ Payment enclosed ☐ Bill me later

Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No._____ Exp. Date_____

Add $2 per issue for postage to Canada and all other foreign countries. Please allow 30 to 60 days for delivery of first issue.

PC4Z056

HOW TO RIGHT A LOT OF WRONGS FOR $59.95.

Most word processing programs create more problems than they solve. Introducing the first program that rights all those wrongs: THE WRITE STUFF.®

WRONG #1: WORD PROCESSING PROGRAMS ARE EXPENSIVE.

Some people say software has to be expensive to work well. We don't agree.

THE WRITE STUFF is everything those more expensive programs should be. And more: It's affordable. Only $59.95. And it's available for Apple® II+, *IIe*, *IIc* and IBM® PC, XT, and compatible computers.

WRONG #2: GOOD WORD PROCESSING PROGRAMS ARE HARD TO USE.

THE WRITE STUFF was written for Harper & Row by the co-developers of The Bank Street Writer™, the best-selling word processor for children. To say that it's easy to use is an understatement. Twenty minutes is all it takes to master THE WRITE STUFF. Your "help menu" of functions and commands is just a key away. Creative Computing calls it "as simple as using a typewriter...an excellent word processor."

WRONG #3: YOU GET WHAT YOU PAY FOR.

There's virtually no word processing function THE WRITE STUFF can't perform. As well as options you only find in programs costing five times as much: word count, complete cursor control, variable speed scrolling, undo any change in one step, on-screen underline and **boldface**, automatic save, and more.

WRONG #4: GREAT SOFTWARE COMES FROM SOMEONE'S GARAGE.

THE WRITE STUFF is from Harper & Row, one of the world's leading publishers. We've been recognizing great writing for more than 150 years, even before Mark Twain brought us Huck Finn. We think you'll find THE WRITE STUFF right in his league.

© 1984 Harper & Row 10 E. 53rd St. 20th fl. New York NY 10022 (212) 207-7492

Harper&Row.
Software for people.™

CIRCLE 158 ON READER SERVICE CARD

The TopView Phenomenon

IBM's forthcoming TopView windowing system is more than it first seems. It can accommodate almost any program, is an efficient and lightning-quick performer, and has a great user interface.

It's hard not to get excited about *TopView*.

As you've read in the PC News section of *PC*, when IBM announced its latest set of PC-family goodies, among the items was a high-powered windowing system called *TopView*.

TopView, I regret to say, won't be available to the public until next year. A few hundred lucky software developers were given preliminary copies of *TopView* to begin working with. In addition, I can now reveal that months before *TopView's* announcement, a small handful of outsiders—myself included—were brought into IBM's Boca Raton inner sanctum to experiment with and comment on *TopView*. Accordingly, I can give you a report on *TopView* based on months of hands-on experience.

What is *TopView?* It's a lot more than it appears to be. At first, *TopView* seems to be a simple windowing system, a system that lets you have more than one program active at a time and switch from one to another with ease. If we give each program a separate part of our display screen to use, we've divided the screen into "windows"; that's where the term *windowing system* comes from.

This year, it seems as though dozens of windowing systems are being developed for the PC. Some use the graphics-oriented "Star technology" introduced in the Xerox Star computer and made famous in Apple's Lisa and Macintosh. The best-known such windowing system for the PC is Microsoft's *MS-Windows* software. While I believe Star technology is truly the wave of the future, I don't think its time has come for the IBM PC world. For one thing, about two out of three PCs use the monochrome display, and systems like *MS-Windows* require a graphics adapter.

Peter Norton

Unlike its competition, *TopView* really has what it takes to work with the millions of PCs in use today. What sets *TopView* apart is that it can work with just about any PC and any software out there. As a character-based (and not a graphics-based, or Star-type) system, *TopView* can work with either monochrome or graphics-equipped PCs.

The Welcome Mat

Even more importantly, *TopView* is extraordinarily good at accommodating programs and making them work well in the *TopView* environment. That isn't easy. Many unruly programs are difficult for a windowing system to tame. A program can do all sorts of things to make life difficult for any system to operate more than one program at a time. The most famous and widespread kind of unruliness is writing output directly into the display screen's memory (instead of using IBM's approved methods for creating display output). But many other kinds of unruliness exist, including changing interrupt vectors, fiddling with the keyboard, and a lot more.

Extraordinarily enough, *TopView* manages to tame almost all programs. Every single application program that I use runs under *TopView* with no difficulty. While the whole point of a windowing system is to let us simultaneously run the programs that we want, oddly enough, many windowing systems will work only with programs that have been custom-tailored for them. Those systems make *TopView* look very good indeed.

What's the point of using a system like *TopView* that can run several programs

Don't buy a spreadsheet

A lot of electronic spreadsheets just can't cover your needs. They don't go far enough.

They're unable to work like you or adapt to the way you think.

Time for Microsoft® Multiplan,® the high energy spread. A spreadsheet with more workspace than the other leading spread. Full of high performance capabilities for your IBM® PC, PC XT, PC jr. or other MS™-DOS microcomputer.

Multiplan loves you as you are.

Other spreadsheets force you to learn how they think. Multiplan learns how you think. It remembers the way you work. Anticipates frequent commands. Even offers suggestions on spreadsheet set-up.

Commands are in English. So are formulas. Instead of typing mysterious coordinates like H54 − L73 = BK154, you can simply name worksheet areas: Sales − Costs = Profit.

that spreads too thin.

Multiplan can link information in different spreadsheets. When you make a change on one, every related one is changed.

Multiplan has optional Multiplan Application Programs that work with you to design and build custom spreadsheets for Budget Analysis, Financial Statement Analysis or Cash Planning in minutes. Not hours. Or days.

The trained mouse.

Multiplan has an optional Mouse. A handy little critter that flies through Multiplan so easily you barely have to lift a finger to select and execute commands. Small wonder Microsoft gets more performance out of a spreadsheet. We designed the MS-DOS operating system that tells the IBM PC how to think. And our BASIC is the language spoken by nine out of ten microcomputers worldwide.

MICROSOFT®
The High Performance Software

To get the best spread call 800-426-9400 (in Washington State call 206-828-8088) for the name of your nearest Microsoft dealer. Now featuring Multiplan at a reduced price: **$195.**

Suggested list price shown for Multiplan.

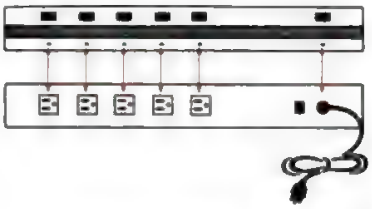
Microsoft and Multiplan are registered trademarks and MS is a trademark of Microsoft Corporation
IBM is a registered trademark of International Business Machines Corporation

Until now your PC was missing an essential piece. Master Piece.™

Introducing the only accessory your IBM® PC will ever need. The Master Piece is four accessories in one, offering your PC the protection and convenience it's been missing.

SEE EYE TO EYE WITH YOUR IBM PC.

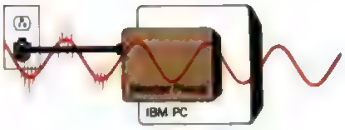
The Master Piece provides a swivel for your monitor. This swivel lets you adjust the viewing angle of your monitor with just the touch of a finger.



PUTS YOUR ENTIRE SYSTEM AT YOUR FINGERTIPS.

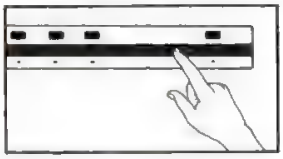
Stop fumbling with cords and scrambling for outlets to plug in your peripherals. Stop lunging to the other side of the room just to turn on your printer. The Master Piece functions as a five outlet power strip to organize all your power needs. Power up with the master switch, then use the individual switches to control your peripherals. Touch the master switch to shut down and the Master Piece makes sure you never accidentally leave your peripherals running overnight.

POWER LINE PROBLEMS ARE NO PROBLEM.



Surges, spikes and line noise are responsible for 70–90% of PC malfunctions. They can wipe out memory in your PC, taking hours of hard work with them. That just costs you time. Even worse, they can zap your delicate chips, sending your PC in for repairs. That costs you money.

The Master Piece stops power line problems dead. You end up with an IBM that's more accurate and more reliable.



EVEN YOU ARE A THREAT TO YOUR IBM PC.

During the course of an active day, you build up static electricity—just as much a threat as surges and spikes. Until now, the only solutions to static were unsightly floor mats or pads that fit under your computer. The Master Piece offers an elegant alternative. Just touch its nameplate before you begin work and all static charges are safely grounded.

Master Piece, the most versatile, most convenient, most useful peripheral ever made for the IBM. In fact, you'll come to think of it as the piece your PC was missing. Special introductory price, $139.95 at most computer stores.

KENSINGTON™ MICROWARE

251 Park Avenue South, New York, NY 10010, (212) 475-5200, Telex: 467383 KML NY.

Trademarks: Master Piece/Kensington Microware, IBM/International Business Machines

© 1984 Kensington Microware Ltd

CIRCLE 275 ON READER SERVICE CARD

simultaneously? I can see three reasons. First, when we run programs that don't need our attention to get their work done (such as programs that generate printed reports, or compilers), we don't have to tie up the computer. Without a system like *TopView*, if we're running a database report, our computer is completely tied up doing that one thing. With *TopView*, we can get on with some other task while the report is working away in the background.

A second reason for running programs concurrently is simply to have them on standby. At times, you'd like to put the work you're doing on hold, switch to something else for a moment, and then switch back. In the usual computer environment, switching back and forth means going through the annoying steps of starting up and shutting down your programs. But with a system like *TopView*, you can leave as many programs as you like on hold, ready and waiting for you to use them.

The third reason for running programs simultaneously is integration. People use *1-2-3* and its competitors so they can combine word processing with a spreadsheet and other functions. But to use a program like *1-2-3* or *Framework*, you have to adapt to its style of work. What if you would like to combine, say, *WordStar* with *VisiCalc? TopView*, in effect, lets you put together a loosely integrated package out of your own choice of parts. Choose your favorite word processor, spreadsheet, programming language, and so on and make them all work together. Of course, with *TopView* you don't get tight integration, but you can combine pieces and share data through *TopView's* ability to "cut" data from one program and "paste" it into another.

Great Performance

Now, do all these features work well in *TopView?* You bet. To test *TopView*, I created some exercises. One was a performance monitor that measured just how efficiently *TopView* could run multiple programs. I was amazed (so was IBM when I reported the results—the company hadn't had a chance to create its own performance monitor). I found that, under normal circumstances, *TopView* has practically no overhead, leaving all the computer's horsepower for our programs. Even with ten programs running—which requires a lot of supervision from *TopView*—only about 15 to 20 percent of the computer's power went to overhead. On a PC AT, the overhead would be more like 2 percent.

The most mind-blowing test I did of *TopView* was a window-moving exercise. I set up a display in which *TopView* has three overlapping windows on the screen: three rectangles of information, the first on top of the second, the second on top of the third. Then, using *TopView* commands, I start moving the middle window around the screen using a mouse for quick movements. Now, when I move this middle window, it has to disappear behind the top window and also cover over the bottom window. Then I start whipping the mouse around, so that my middle window is racing wildly around the screen. *TopView* has to do lots of work to figure out where I've moved the mouse, calculate where the middle window should be (including all the information inside that window), and also calculate which parts of the three windows should be covered up or not.

> TopView has little overhead, leaving all the computer's horsepower for our programs.

While all this is going on—and I'm moving the mouse very fast—the screen display is keeping up with my movements easily.

That's not the half of it. What I've told you about *TopView* are things you will see for yourself when you use *TopView* with ordinary programs. The most amazing part of *TopView*—the part that repeatedly astonished me each time—is the special facilities that it has for programs written specifically to run under it.

User Interface

TopView has an amazing user interface that includes windows, panel areas on the screen, keyboard control, cursor control, mouse control, list scrolling, item selection, multiple-field data input with prompting, and more. It's an absolutely astonishing array of sophisticated program support that I could hardly begin to describe.

TopView's user interface is one of the most fantastic things I've ever seen, and it's all on tap for any program that wants to use it. It will have very far reaching effects, once people latch onto it.

Stop and think about it. Most programs we use have rather poor user interfaces—inferior ways of handling keyboard input and screen output—simply because writing a first-rate user interface is a huge task, one that only a Lotus Development Corporation or a Microsoft could really undertake. Time and money constraints have forced many "small" (but useful) programs to make do with rather crude interfaces.

Now, for anyone who wants to take advantage of the *TopView* interface, a ready-to-use set of facilities is available that makes the old state of the art look modest by comparison. Someone at Lotus Development Corporation put it to me this way: before *TopView* appeared on the scene, *1-2-3* had impressed a lot of people with its user interface. Now, with *TopView*, anybody's programs can look better than *1-2-3*.

This interface is what makes *TopView* a "sleeper." It's going to take a while before people understand what *TopView* can really do. But when they wake up to it, and the *TopView* bandwagon gets rolling, we're gonna see some incredible stuff. ■

You can't buy an IBM® PC with

Here are five important measurements to help you make the best choice:

IBM forces you to choose:

Buy a monochrome card and monitor for high-resolution text. (Essential for word processing and spreadsheets.)

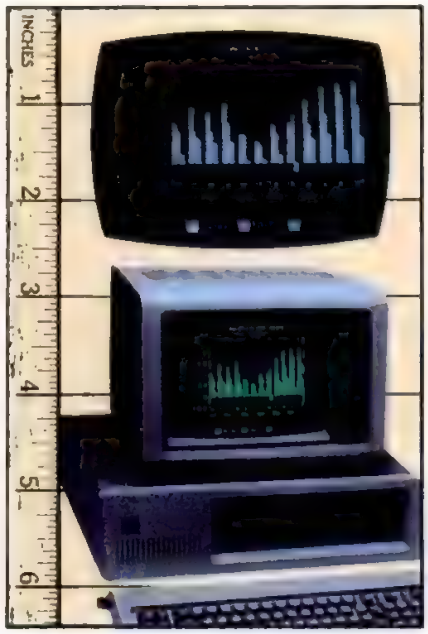
Or buy a color card and color monitor for graphics. (Lotus™ 1-2-3,™ for example, uses lots of graphics, as well as text.)

You can invest in both; you can sacrifice one or the other; you can settle for a non-standard compromise.

Or you can buy Paradise.

Here's how we've measurably eased your job of choosing the best video display (saving you a lot of money in the process).

1. Measure video functions.



The Paradise Modular Graphics Card™ gives you *full screen, 16-shade* graphics on *any* display, including IBM's high-resolution monochrome monitor.

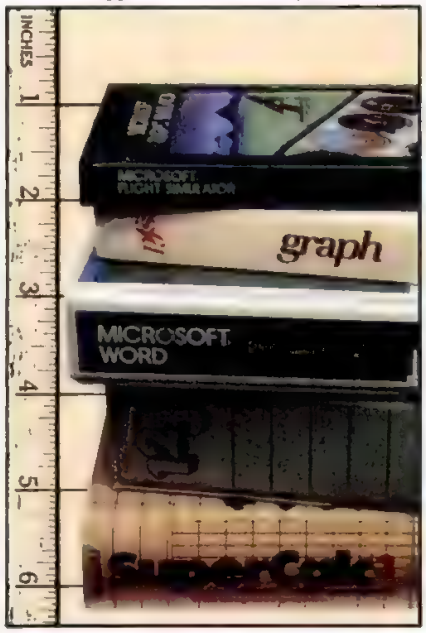
IBM's color/graphics card can display 16 colors on a color monitor.

So can the Paradise Modular Graphics Card.

But that's where the similarity ends. When you use color/graphics software with the Paradise Modular Graphics Card and a monochrome monitor, it translates those colors into a true 16-shade gray scale. With full screen display, flicker-free scrolling and clear, crisp character sets (like those of IBM) in all modes.

Naturally, the best video card fits either the IBM PC *or* XT, and works with any monitor you choose: IBM monochrome (or equivalent), RGB or composite video.

2. Measure software compatibility.



Many video cards only work with specially modified software. The Paradise Modular Graphics Card runs popular off-the-shelf color/graphics software on your choice of monitors. *Unmodified.*

Most cards that offer graphics on a monochrome monitor force you to sacrifice off-the-shelf software compatibility.

Paradise doesn't want you to compromise.

Of course the Paradise Modular Graphics Card runs Lotus 1-2-3 graphics on an IBM monochrome monitor.

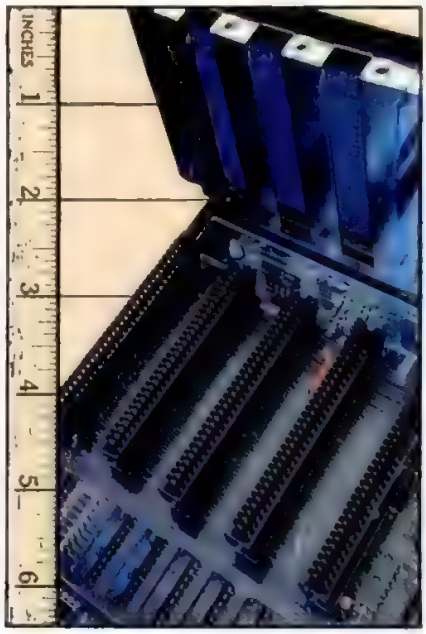
But it also runs almost all unmodified off-the-shelf color/graphics software.

Like PFS®:GRAPH, SuperCalc,®3 Flight Simulator® and Symphony.™

No wires. No tricks.

A menu-driven software system—with a user interface much like that of Lotus 1-2-3—lets you take advantage of all the Paradise Modular Graphics Card's features.

3. Measure slot utilization.



Unlike other video cards, the Paradise Modular Graphics Card gives you *additional popular functions in a single slot.* This may be the only card you'll ever need.

You need to worry about slots for future expansion. Since you *must* use

out choosing a video card.

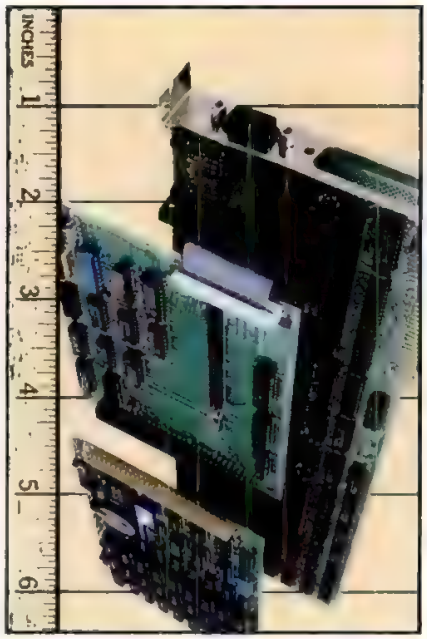
a slot for video support, why not pack it with more functions?

The Paradise Modular Graphics Card puts color and monochrome video support *plus* your choice of the most commonly requested enhancements into one slot.

Enhancements like extra memory, clock calendar, floppy disk controller, parallel, serial or game ports.

Leaving you measurably more room to expand.

4. Measure cost efficiency.



Unlike other multifunction cards, the Paradise Modular Graphics Card lets you choose the options you need, now or later.

You select the features you *want*, when you want them—no more, no less. So you pay only for what you need.

Choose one module from list A, one from list B, or one from each list. The Paradise Modular Graphics Card fits in a single PC *or* XT slot, even with both modules attached. And without imposing on adjacent slots.

5. Measure value.

Value: the ratio of performance to price. No matter how you configure the Paradise Modular Graphics Card, you get more performance for your money, and more performance for your slot.

You'd have to combine several other cards to even approach the Paradise Modular Graphics Card's functionality.

Obviously, that would take up several slots in your PC.

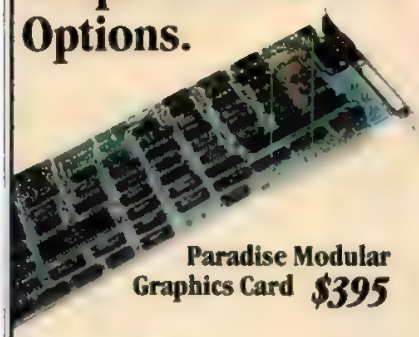
It would also cost you a lot more money.

And if you review measurements one through four in this ad, you'll realize that no other card—or combination of cards—can give you better PC performance.

What about reliability?

Guaranteed by a one year warranty.

Paradise Modular Graphics Card and Options.



Paradise Modular Graphics Card ***$395***

Connectors for:
IBM (or equivalent) monochrome monitor *or* • RGB monitor *or* • Composite video monitor • Light pen • RF modulator • Expansion modules

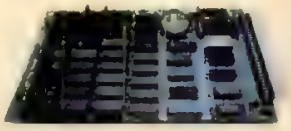
Addressing:
16K video memory starting at B8000H

Software included:
RAM disk • Print buffer

A Module Options:

Parallel printer port *or* • Serial RS232 port *or* • Game port

B Module Options:



256K RAM memory/clock calendar *or* • 384K RAM memory *or* • Floppy disk controller/parallel printer port

Go to the IBM dealer nearest you or call us toll-free.

Within CA:
800-822-2020 (Dept. 119)

Outside CA:
800-527-7977 (Dept. 119)

150 North Hill Drive, Brisbane, CA 94005
(415) 468-6000

PARADISE

You can measure it.

Registered trademarks: IBM International Business Machines Corporation, PFS Software Publishing Corporation, Flight Simulator–Microsoft Corporation, Supercalc3–Sorcim Corporation **Trademarks:** 1-2-3, Lotus, Symphony–Lotus Development Corporation, Paradise, Paradise Modular Graphics Card–Paradise Systems, Inc.

Introducing The Two Advantag

C·I·P Is Visibly More Powerful Than PFS.®

Until now, if you wanted database software that was easy to use, you had to settle for PFS.

And PFS is fine. If you don't have very much to do. Or if your business has very simple needs. But whose business is simple these days?

Now there's C·I·P. The first and only visual file manager for your IBM PC,® XT or compatible.

C·I·P simply lets you do more. You see, with C·I·P you can customize forms and reports right on the screen. Quickly and easily. Before your very eyes. And when you print your information, you get exactly what you see on the screen. No surprises.

C·I·P also gives you the power of date arithmetic for real business needs such as agings, schedules and tickler files. You can't count on PFS for that.

Plus, with C·I·P all fields can be "keyed" for faster access and reporting. With PFS, your choice of "key" fields is limited to just one.

So why settle for PFS? Especially when there's so much more to see with C·I·P.

IBM PC and PC XT are registered trademarks of International Business Machines Corporation. PFS is a registered trademark of Software Publishing Corporation. dBASE is a registered trademark of Ashton-Tate. © Concurrent Data Systems, Inc., 1984

es Of C·I·P™ Database Software.

It's Easy To See Why C·I·P Is Easier To Use Than dBASE.®

Until now, if you wanted to perform serious file management applications, you had to unlock the mysteries of dBASE.

But that could take weeks, months, even years of deciphering obscure, nerve-racking code. And who could survive that?

C·I·P to the rescue. The first and only visual file manager for your IBM PC, XT or compatible.

C·I·P is no dBASE. And thank goodness for that. It's the powerful choice for people who want to avoid dBASE overkill. C·I·P lets you perform important file management applications.

C·I·P

CIRCLE 123 ON READER SERVICE CARD

And all without lifting a finger to program.

Using easy-to-understand menus and keyboard icons, you can see your way to doing most anything. Managing customer files, tracking sales leads, scheduling inventory. And all in the blink of an eye.

So why waste time with dBASE? When you can show your business who's boss with C·I·P.

Now for the best part. If you're already using PFS or dBASE, no problem. You don't have to re-enter your data. Just transfer your files to C·I·P. It's that simple.

I like what I see in C·I·P!

☐ Please send me a trial size version of C·I·P. Enclosed is my ☐ MasterCard ☐ VISA ☐ check for $9.95 payable to Concentric Data Systems

☐ Please send me more information on C·I·P.

Save time! Call **1-800-325-9035.** Between 9–5, Monday through Friday, Eastern Time. In Massachusetts call **617-366-1122.**

PC 11/13

NAME _____

COMPANY _____ TITLE _____

STREET _____ PHONE _____

CITY _____ STATE _____ ZIP _____

CARD # _____ EXPIRATION DATE _____

SIGNATURE _____

Concentric Data Systems, Inc., 18 Lyman Street, Westboro, MA 01581

Meet the

Standard.

AST SixPakPlus™ has set the standard 100,000 times.

We have manufactured and shipped more than 100,000 SixPakPlus multifunction boards—an event that proves quality and quantity are compatible. AST has maintained the same high set of quality standards from our first SixPakPlus board, to our 100,000th in less than a year. No one in the industry has set that kind of standard!

Important as it is, quality is just one of the factors that has made SixPakPlus the most popular, most respected multifunction board available today. Broad performance capabilities is yet another.

SixPakPlus provides users of the IBM PC and XT and their compatibles with an ideal combination of enhancements to give you all these benefits on a single board:

- When you need more memory to run sophisticated software programs and process more data, the SixPakPlus gives you an additional 64K to 384K RAM.
- If you want to add peripherals such as printers, modems, mice, plotters or joysticks, we give you more Input/Output ports—serial, parallel and optional game adapter.
- More convenience, thanks to a built-in clock-calendar that provides automatic time and date stamping.
- More productivity with SuperPak™ utility diskette including SuperDrive,™ *PC World's* User Survey award-winner, that works like a drive but fifty times faster—and SuperSpool™ so you can print and input at the same time.

Quality even extends to the documentation, making SixPakPlus one of the easiest hardware/software packages to install and operate.

We continue to set the standards by providing the best possible user information. In fact, with our new audio cassette you don't even have to crack our manual to learn how to take full advantage of all SixPakPlus features and functions.

Now meet the standard for multifunction enhancement boards in person. Get a SixPakPlus from a dealer near you—the proven winner for your PC expansion needs. SixPakPlus is a member of the complete AST family of multifunction boards; Micro-to-Mainframe communications, LAN and graphics products.

Contact: AST Research Inc.,
2121 Alton, Irvine, CA 92714
Telephone: (714) 863-1333
TWX: 753699ASTR UR

*IBM PC and XT are registered trademarks of International Business Machines

AST RESEARCH INC.

CIRCLE 101 ON READER SERVICE CARD

Welcome
to
TopView
Press T to see the TopView Tutorial
Press ↵ to continue
IBM
IBM

COVER STORY • PAUL SOMERSON

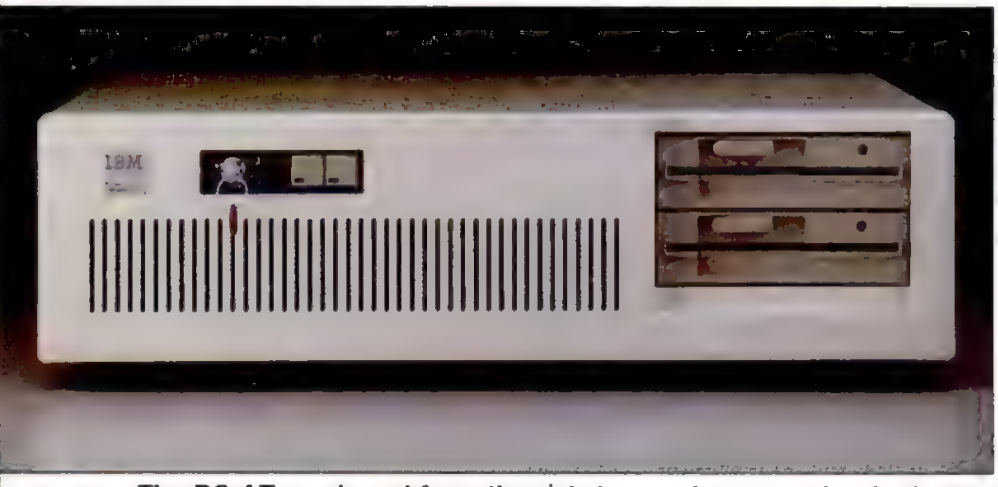
IBM BRINGS OUT THE BIG GUNS

IBM's dazzling new AT gives micro users awesome speed and power and turns the compatibles industry on its ear. This multi-user marvel is unquestionably the new standard.

Photograph: Shig Ishii

Copyrighted material

The PC AT is IBM's first real microcomputer. When IBM introduced the original PC in 1981, it was just testing the market; the PC-1 came with a paltry 16K of on-board RAM, a cassette port, and a BASIC ROM that couldn't divide by 10. But the overall design was decent enough to let the IBM marketing steamroller flatten the competition. The PC-2 and PC-XT were minor variations, not wholesale re-engineerings.



The PC AT as viewed from the front. The window adjacent to the nameplate contains a keylock, as well as a power-on indicator light and an LED for the internal 20-megabyte fixed disk. The upper floppy drive (at right) is for new high-density disks. The lower drive space is for an optional 360K floppy drive (as shown) or for an additional 20-megabyte fixed disk. The primary fixed disk is located in the center of the machine behind the ventilation grille.

In late 1983, however, despite persistent rumors that IBM was on the verge of announcing a breakthrough multitasking machine, increasing numbers of competitors began nipping at the PC's heels by offering computers with faster clocks and more powerful CPU chips. Once-invincible IBM had stumbled badly with the hapless PC*jr*, and the company's subsequent PC Portable was universally panned as an overpriced Compaq imitation.

Sales of IBM PCs and PC-XTs had begun to slow, prompting some myopic analysts to suggest that IBM was out of touch with the micro-hungry customer, technologically addled, and about to slide from the top of the heap. Of course, many of these critics were the same pigeons who extolled various Apple playthings as serious business computers. But the market was clearly not all IBM's. Tandy was flogging its uncharacteristically business-like 2000. Compaq took the handle off its luggable, revved up the clock, and trumpeted its pricey DeskPros as IBM-busters. AT&T yanked a creditable Italian workstation through customs and into the stores. Bit players from Eagle to Sperry watched IBM take its knocks and introduced me-too machines of their own. Then IBM dropped the bomb.

Although in the past IBM usually met such micro challenges through displays of marketing muscle rather than high-tech prowess, this time it has responded by cobbling together a truly awesome computer at a very aggressive price. Many observers feel IBM could have charged $1,000 to $2,000 more and not lost too many sales. And IBM isn't in the charity business. The $4,000 to $5,700 sticker was clearly meant to knock the competition out of orbit. It also signaled an imminent price reduction in IBM's other, now-overpriced micro hardware. Grim competitors may dismiss the AT as just a supercharged PC-XT, but it's a safe bet that its lowball price tag and the downward push it exerts on prices of lesser machines mean the hands that hold the reins at compatibles manufacturers may soon be reaching for the local want-ad sections.

PC FACT FILE

IBM PC AT
IBM Entry Systems Division
P.O. Box 1328
Boca Raton, FL 33432
(800) 426-3333
List Price: $3,995 with 256K RAM, 1.2 megabyte floppy disk drive; $5,795 with 512K RAM, 1.2-megabyte floppy disk drive, 20-megabyte fixed disk, serial/parallel adapter.

CIRCLE 742 ON READER SERVICE CARD

New Features Galore

IBM is offering the AT in two configurations—stripped or stuffed. Both are

based on the same IBM model 5170 chassis, housing a 6-MHz Intel 80286 chip, eight expansion slots (six of which are socketed for 16-bit addressing), a built-in battery-operated clock and calendar, 256K of on-board RAM, a power supply half again as large as the PC-XT's and three times the size of the PC's, a temperature-sensitive variable-speed fan, a new "high-capacity" floppy that holds 1.2 megabytes of data, a new single disk controller that can handle this new quad-density drive as well as IBM's new larger fixed disk *and* the conventional 160/180/320/360K floppy, and such incidentals as a power on/off light and a key that locks the cover and prevents unauthorized use.

The Enhanced model tosses in another 256K of RAM (for a total half-megabyte), a serial/parallel I/O adapter on a shared printed circuit card, and an internal 20-megabyte hard disk with a lickety-split 40-millisecond average access time. Neither model comes with a display card or a monitor, which adds another $600 to $900 to the unit price and is especially disappointing to those users who were hoping for a new, high-resolution color graphics adapter and screen.

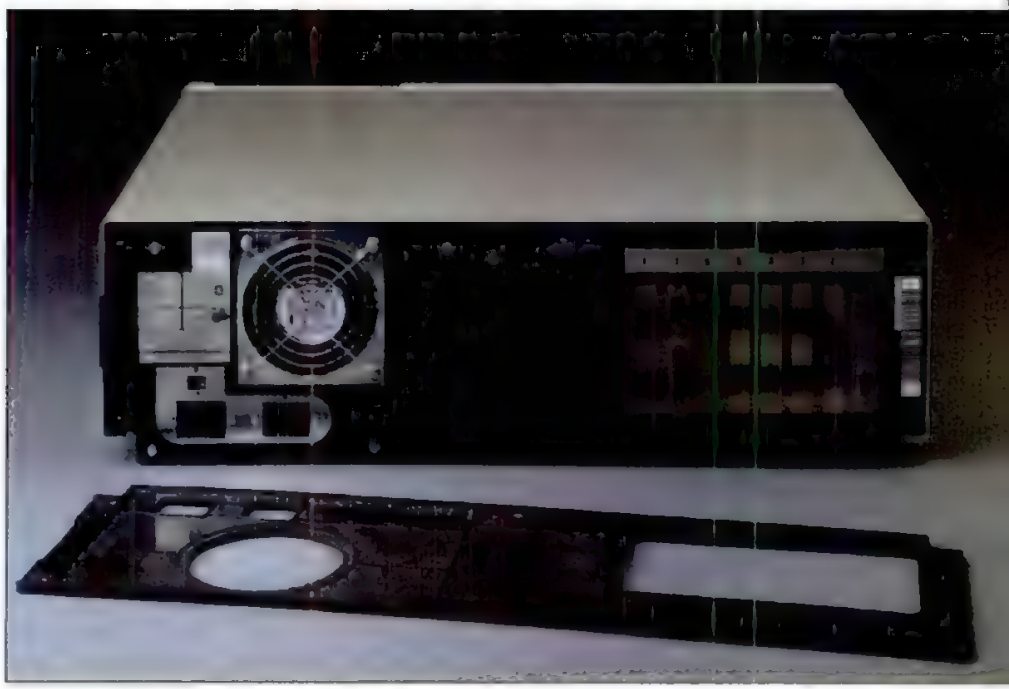
International Power

The power supply on both models is switchable for American or European wiring, and a new set of DOS 3.0 utilities reconfigures the keyboard for British, French, Italian, German, or Spanish operation. (DOS 3.0 is required to handle the large AT high-capacity floppy and hard disks, although the computer will boot and run most earlier versions so long as the disks don't use exotic timing or track-formatting copy-protection schemes. Apart from a smattering of code fixes and new utilities, DOS and BASIC 3.0 are nothing new and do *not* replace DOS 2.1 on earlier machines. DOS 3.1, expected in the fall, will be identical to 3.0 except that it will support the new IBM network.)

While the PC keyboard generated a remarkable amount of user venom, the AT keyboard is unassailable. IBM obviously listened to the many complaints but retained the sculpted, sloping look, the dished keys, the crisp, slightly off-center touch, and the tactile and auditory feedback that make all the imitators just pallid, plastic toys.

The AT keyboard now resembles that of a stretched Selectric, complete with an oversized, J-shaped Enter key, and fat shift keys in their familiar spots without any intervening potential pinky problems. For those with errant fingers and short memories, IBM slapped on green LEDs to indicate the states of the NumLock, CapsLock, and ScrollLock keys. Even the small trouble spots have been properly attended to. The Esc key, which could cancel a line in BASIC or DOS if erroneously struck when you were reaching for the Tab, 1, or F2 keys, has now been banished to the cursor pad along with the PrtSc, which was too easy to hit in combination with the shift, hanging the computer if the printer was off-line. And the tilde/grave key that was the bane of tyros

The PC AT as viewed from the back. IBM supplies a standard removable plastic panel to dress up the appearance of the system unit. Note the eight expansion slots. One must contain the disk controller card, and one the monitor driver. An additional serial/parallel card is standard on the enhanced model.



Photographs: Les Morsillo

For the AT Only—A Great New Keyboard

The AT's keyboard is an improved version of the PC's with the good points retained and the irritating ones corrected. But it only works with the AT.

At first glance the PC AT's keyboard doesn't seem much different from the PC's. When you take a closer look, you'll find most of the changes are subtle, but they are all important—and long overdue.

The AT's is still the same keyboard with that now-familiar clicking sound and white/gray color scheme.

Enter, Shift, Space

The Enter key, shift keys, and space bar are most altered. The space bar now has extra room around the outer edges, separating it from the Alt and Caps Lock keys. The shift keys are wider and are now contoured and labeled. Even the Enter key is labeled. The arrows remain on those keys, but the labels are welcome additions.

The Enter key now has a different shape, strongly resembling that of a typewriter Return key. It will be hard to miss the "target" from now on when entering data. The shift keys slope upward and outward—comfortable to the touch and a breeze to use. As does the new Enter key, the shift keys leave you plenty of room to hit your mark, a change that will certainly cut down on errors.

IBM has not labeled the Tab or Backspace keys—they still only have arrows on them. The Tab key is wider, while the Backspace key is narrower and has been moved to the right slightly (above the Enter key).

It's hard to miss the row of three green LED indicator lights on the upper right-hand side of the keyboard. They show when the CapsLock, NumLock, and ScrollLock keys are activated.

This arrangement is better than that on Key Tronic's enhanced PC keyboard, which has red LED indicator lights on the keys themselves. Placing the lights high on the keyboard makes it easy to see which keys are on without lifting your fingers.

Moved Keys

The sometimes troublesome Esc key has been moved to a relatively harmless position at the top left-hand side of the numeric keypad above the Home key. Anyone who has ever tapped the Esc key instead of the Tab or 1 key will appreciate this change.

The Backspace key, although it hasn't been moved far, could be a problem on the AT because of its small size. The combination of the shrinkage and the move could cause you to tap the Pipe symbol key instead.

Two typing keys have been moved to

The PC AT's keyboard is substantially different from its predecessors. Note the enlarged Enter and Shift keys, the segregation of the number/cursor pad from the main typewriter keys, and the general Selectric appearance. The three squares above the pencil ledge contain indicator lights for the CapsLock, NumLock, and ScrollLock keys.

new locations on the new keyboard. One won't make much difference, but the other one will. The tilde (~) key has been moved to make way for the larger Enter key. It won't be missed by most PC users in its new position where the Esc key used to be.

The shift of the Pipe symbol key (| and \) will be noticeable. Since the backslash is used extensively in DOS path names, it will take some time for those who work with hard disks to get used to its new position near the smaller Backspace key.

Numeric Keypad

The function keys are untouched. The numeric keypad is now distinctly separate from the typing area, with no overlapping Ins key. Ins has been moved completely into the keypad. Its top is contoured like most of the larger keys, while the Del key has been shrunk.

This new arrangement for Ins and Del will delight *WordStar* users, because the two are more easily distinguishable. The changes in the Ins key will reduce your likelihood of tapping the CapsLock key instead.

The numeric keypad also sports such improvements as a shorter plus sign key. The minus sign key is the same size, but it has moved down slightly to make room for the newly positioned PrtSc key, which is now just above it. Just above PrtSc is the newest key, SysReq, which will be used in networking.

The NumLock and ScrollLock keys still rest at the top of the numeric keypad, but they are now smaller (the same size as most other keys on the keyboard). Each key has been moved inward: NumLock is now over the 8 key and ScrollLock over the 9 key.

IBM must have heard the complaints from PC users about the PC's not-quite-long-enough 6-foot cord, because the cord to the AT's keyboard is 10 feet long—a marvelous (and badly needed) touch.

The keyboard is basically the same size, although it's a bit deeper at the top. The changes have made it cleaner looking and less cluttered.

All the improvements were needed; you'll find you have fewer problems since most of the nuisances and irritations are gone. Sadly, this keyboard is only for the AT: It will not work with the PC or XT.

In inches, this keyboard's dimensions are: width, 18.4; depth, 8.3; height, 1.5, and it weighs in at 6 pounds.

Of course there will be those who, as always "want more;" and such improvements as an LED indicator for the Ins key, function keys across the keyboard's top, and perhaps a separate cursor movement keypad (like on the Texas Instruments personal computer) will be valid items on the PC AT wish list.

That wish list and slight adjustments to be made are more than compensated for by all of the PC AT's slick improvements and welcomed refinements.

If you do get an AT, you may need time to get used to it. But for the most part, the new keyboard will prove to be an effortless link to the new AT technology. —**Bil. Alvernaz**

"While the new key layout makes sense and defuses many of the tired old complaints, it isn't perfect."

trying to enter a line is up out of danger above the Tab key.

The keyboard is divided into three tidy sections. Instead of the relatively unruly arrangement to the right of the PC and PC-XT Enter keys, the AT sports the same kind of metal dividing strip that ropes off the function keys. The new cursor pad is far more geometric and orderly than its predecessor and contains a new, 84th key—SysReq. SysReq currently does about as much by itself as ScrollLock, however, it may become popular if and when users ever start chaining their systems together.

While the new key layout makes sense and defuses many of the tired old complaints, it isn't perfect. IBM truncated the Backspace key to wedge many of the old offending keys and the new SysReq key into the upper right-hand corner. While the cursor-right keytop has no real estate to its east on the PC and PC-XT, the gray minus sign hunches to its right on the AT, which often results in a row of dashes when an ex-PC user distractedly tries to tap the cursor rightward. Similarly, the PC/PC-XT Del keytop hugs the bottom right-hand spot, while this honor goes to the gray plus sign key on the AT, resulting in failed erasures for the ex-PC crowd. But the worst move of all is probably burying the small, new AT Scroll Lock key between the NumLock and SysReq keys. When programs began spinning out of control on a PC or PC-XT, you could hold down the Ctrl key and punch the keyboard in the upper right-hand corner to bring everything to a halt. This move doesn't do anything on the AT except numb your fingertip.

The keyboard is deeper than the PC's and PC-XT's and trails a 10-foot-long cord coiled in the middle. But don't expect to plug one into any pre-AT machine; the AT keyboard has a bidirectional serial interface that only an AT can understand. And, since both the keyboard and the AT itself are deeper than their antecedents, much more space vanishes beneath the system. Rather than reduce the desktop footprint by cramming the contents into a teetering tower like the Macintosh, IBM is offering a "floor standing enclosure" that stashes the system unit out of sight. With so much hard disk space, there is almost no need to touch a floppy except when trying to run some crudely protected program that insists on having the original floppy in the A: slot.

The complete AT system, with the IBM RGB monitor and Borland's *SideKick* software package. The PC AT runs most existing PC software, except for programs using tricky copy protection schemes or making nonstandard DOS-type calls.

Hard Disk Safeguards

Data security on virtually every other micro means locking your floppies in a desk drawer. The AT provides the first real system for allowing executives to sleep at night: a hard-to-duplicate "tubular" key locks all but keyholders out of the system. If the system is locked, an unauthorized operator can turn the power switch on and watch the initial diagnostic test, but nothing more. And once the computer is up and running, you can turn the key to the locked position and walk away without having to worry that someone will interrupt the action and make an illicit copy or file change. A locked, operating machine will not permit keystrokes to reach the buffer, effectively shutting out all intrusion. This lock will let you perform long sorts or spreadsheet recalculations without having to sit protectively in front of the screen.

Another potential hazard is theft or destruction of hard files. The AT allows you to store 40 million bytes of data. A

AT the Party

IBM throws a huge, folksy bash in Dallas to introduce the AT and bring its edgy dealers back into the fold.

For years IBM has staged immense, meticulously-planned motivation seminars and gatherings (reputed to resemble fervid revival meetings) for its own sales and management teams. But the face IBM has always shown to the public is one of stiff-backed, hidebound humorlessness.

On August 13th, the day before the formal AT introduction, IBM took off its dour mask and replaced it with a ten-gallon hat and a backslapping good-ole-boy grin. It invited between 1,800 and 2,000 nabobs from the nation's leading dealerships, as well as 200 software developers, to an expense-paid soiree in Dallas it called "Pride in Partnership." The event was ostensibly thrown to celebrate the third anniversary of the PC's release, to show off the AT, and to cement the somewhat testy relationship between IBM and one of its main channels of distribution.

While there really never has been any talk of open rebellion against the Big Blue Hand That Feeds, dealers were bristling at several recent IBM moves. These dealers were facing increased competition from scores of new dealers in their territories, including the newly price-conscious IBM product centers, and were barred from selling some of IBM's more interesting micro/mainframe merchandise. Many dealers had been stuck with PC*jrs* that they could barely even give away. And rumors floated about that IBM was about to axe all but the highest volume operations. To counter these sentiments, IBM executives—never before been seen in public without the IBM-trademark blue suit, white shirt, rep tie, black shoes outfit—

Mr. Philip D. Estridge
President, Entry Systems Division
Vice President
IBM Corporation

cordially invites you to attend a meeting
and anniversary celebration
at the Loews Anatole Hotel
Dallas, Texas
August 13-15, 1984

RSVP
1-800-IBM-2700

donned straw cowboy hats, IBM bandannas, and pointy-toed lizard boots, swallowed hard, and tried their best to become folksy backslappers. And, according to many of the spellbound guests, it worked.

The party was thrown at the Loews Anatole Hotel, the same one that would be used a week later by the Reagan-Bush folks. In fact, IBM executives in their cowboy mufti joked that the sinister-looking Ivy League types counting the house were actually advance men and security agents for the President and his extended party rather than prototypical IBM staffers.

The three-day event was, in the words of one participant, "a barrage of intensive behavior modification techniques from beginning to end . . . a constant psychological bombardment painstakingly choreographed to make the dealers

(continued)

"The AT provides the first real system for allowing executives to sleep at night: a hard-to-duplicate 'tubular' key locks all but keyholders out of the system."

"IBM snapped nearly every one of the 2,000 plus guests, developed all the slides, and assembled them into a huge and flattering slide show—overnight."

(AT the Party continued)

feel that they were part of IBM and wanted more than anything else to be that way."

Everyone a Star

For instance, the opening party was a barbecue at which nothing but hard drinks were served and where the guests received their first dose of culture shock watching the improbably dressed IBM bigshots hobnobbing in their Western outfits. The next morning, after the guests streamed into the main hall to the strains of loud, disco-upbeat versions of the themes from *ET* (get it? ET/AT) and "Star Trek," the lights dimmed and enormous speakers began belting out a stirring rendition of *If My Friends Could See Me Now* as a montage of photographs was projected onto a series of gigantic screens at the front of the room. The photos were all of the partygoers of the previous night. IBM had snapped just about every one of the 2,000-plus guests in their silly hats and bandannas, developed all the slides, and assembled them into a huge and flattering slide show—overnight. The guests stared in awe and appreciation; they had become part of the IBM show, and by extension, part of IBM. The more astute realized as they saw the first faces flicker across the screens and heard scattered cries of recognition in the darkness that, from that moment on, the entire guest list was solidly in IBM's pocket.

Top IBM micro bosses Douglas LeGrand and Philip (Don) Estridge then whipped the spectators into a frenzy with stirring assurances that they were critical to IBM and that IBM was going to help them become successes. Guests later said that it was the single most motivating gospel show they had ever seen and that the euphoria lasted well after the jet ride back home.

Superstar magician Mark Wilson filled in the gaps in the show with his skilled illusions, introducing speakers and machines, making men and computers appear and disappear, which, according to participants, added to the special magic of the entire event. These IBM fellows don't miss a trick.

Throughout the three days IBM lavished gifts of all sizes on the dealers. The smallest were the Western garb and such other souvenirs as a fancy pen and rawhide notebook. The largest was an Enhanced AT at the special, one-time, rock-bottom dealer price of $2,500. Another was the announcement that payment due dates for PC*jr* hardware would be extended until the end of October; this magnanimous gesture brought a cheer from the assembled mass. IBM's aroused recital of its extensive upcoming advertising plans brought a standing ovation. IBM announced that its fall ads will be seen by 98 percent of the population at least once, and by most people at least five times. That's not chump change they're spending.

AT Bingo

This was only the beginning. If the guests weren't totally captivated by this point, IBM pulled out the remaining stops. It handed out Bingo cards to the already inflamed audience and instructed the players to shout out "PC AT!" rather than "Bingo!" when they completed the card. As the numbers rang out through the hall the tension mounted; everyone thought he was going to win an AT. After a few minutes the tension was barely endurable; every participant could see that he and the people around him were only one number away from winning. When the last number was called every single person in the room shouted out "PC AT!" at the top of his lungs.

This was followed by enthusiastic AT demonstrations, gourmet meals with

such touches as an ice carving in the shape of a computer, more exhortative speeches and impassioned pep talks, and more gifts. The Oak Ridge Boys performed one night and IBM gave all the guests the group's newest album—which was no mean feat considering the Boys claimed the album wasn't out yet and were mystified at how IBM obtained copies.

Guests Go Wild

By the end of the party the guests were in a wild frenzy of adulation of their hosts, and as the National Anthem was played over the speakers at the close of the event, one participant shouted that IBM could run the whole country in 10 years. Another guest yelled, "And they'll do a better job!"

The messages IBM sent were that the AT was the machine of the future; that *TopView*, its potentially impressive but crudely implemented windowing and multitasking software package, was going to assume critical importance; that IBM was going to back its dealers with immense advertising outlays; and that it was going to break through the barrier and manage to sell computers to legions of rubes at home by forcing them to "let go of their pasts." If IBM is half as successful with the population at large as it was with the party guests with whom *PC* spoke, there will be a computer bearing the IBM logo on every desk in the country by next year.

Love Letters

The simultaneous press announcement in New York was far more sedate, but equally persuasive. Virtually every bit of ensuing press coverage amounted to a love letter to IBM. The reason is clear—IBM has leapfrogged the competition after waiting for the right time to make its move.—**P.S.**

company's entire payroll, personnel, or R&D records could easily be stored on a hard disk. The AT key locks the cover onto the chassis, preventing casual thieves from unscrewing the case and walking out the door with such vital information. The key also ensures that a spiteful or clumsy operator can't erase all your files with just a few dangerous keystrokes. In addition, the hard disk mechanism can prevent data losses by positioning the heads over a "dedicated landing zone" when the system is moved.

Concerned PC-XT owners can buy themselves the same security by purchasing the $50 IBM PC Keylock Feature (#3177), which will clamp the cover down and prevent power-up unless a key is in the lock.

Rocket Ship Performance

The big difference most AT users will appreciate, at least initially, is speed. It is extremely frustrating to watch a PC grind a floppy for 10 or 20 seconds to read or write a long file. The XT's hard disk is a substantial improvement. But the AT's high-performance fixed disk is more than twice as fast as the XT's. And every other operation—even the initial power-on self-test (POST)—is far speedier.

Once loaded into memory, everything from BASIC programs to expensive applications software runs between two and three times more quickly on the AT than on any other IBM micro. There are several reasons for this speed. The AT clock ticks 25 percent faster than the PC's. The 80286 chip is designed to save steps during certain operations and can process data in bigger chunks. The overall system architecture is more efficient than the PC's or PC-XT's, and the AT can access memory faster. Even the AT's standard floppy is faster—it spins at 360 rpm compared to the PC's 300, and it has a higher data-transfer rate.

This speed is a delightful surprise for users accustomed to long delays, slow

"The big difference most AT users will appreciate is speed. Every operation, even the initial power-on self-test, is far speedier."

"The AT's high-density floppies add a whole new dimension to micro incompatibility, but they can store 600 pages of text on a single disk, making file portability from machine to machine far easier."

Double Your Pleasure, Double Your Fun

The PC AT offers twice the direct memory access and interrupt-driven processes of the original PC.

Two of the original PC's best design features are DMA (direct memory access) and interrupt-driven processes. The PC AT capitalizes on these features by having twice as many.

The DMA controller is a highly specialized microprocessor with the sole task of moving data around inside the computer's memory. Depending on how it is programmed, it moves chunks of data (up to 64K) from one area of memory to another, or it moves data from an I/O device, such as a disk controller, into memory. This dual process is the DMA's primary function in the PC.

DMA works most effectively in interrupt-driven systems. In such systems, the processor executes continually, never looking (polling) to see if any devices, such as keyboards or disk controllers, need attention. Instead, another specialized chip, the 8259A interrupt controller, monitors these devices. Moreover, it can be programmed to recognize some devices as having higher priority than others. Simultaneous requests for attention from, for example, the disk controller and the keyboard, are arbitrated without disturbing the CPU. The DMA controller also decides which processes are interruptible and which are not.

Once it has resolved such issues, the interrupt controller stops the CPU and forces its attention to the device requesting service. If the task requires a bunch of bytes to be moved from one place to another, the DMA controller usually does the job. And after the sector has been read or the character has been captured, the CPU picks up the previous task where it left off.

Interrupt channels are in short supply on the PC. Add-on boards, such as network cards, serial expansion ports, and tape controllers, are often designed to use the same interrupt line and can conflict with one another. Most of these conflicts can be resolved by changing a jumper or two, but the PC can accommodate only a limited number of devices.

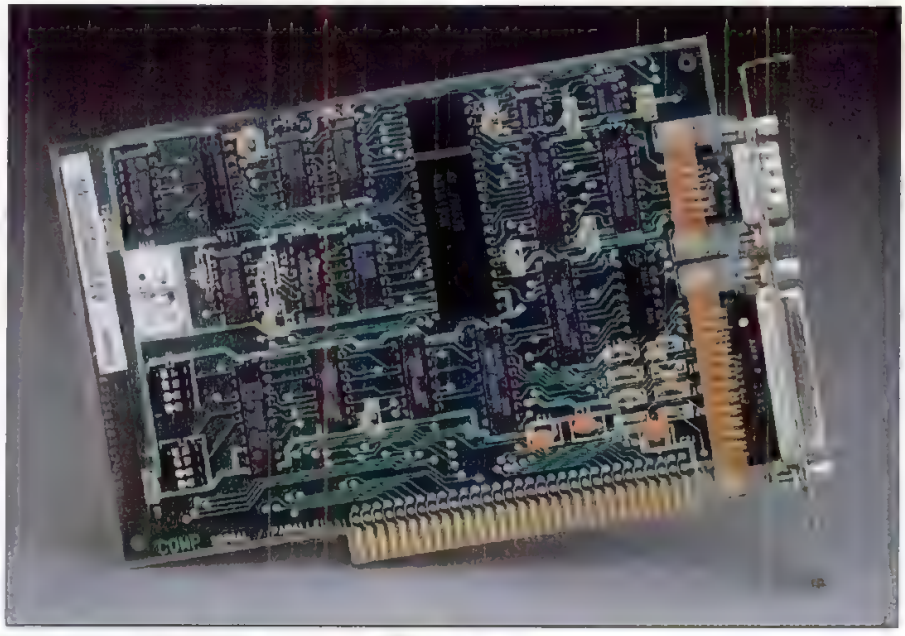
Doubling DMA

The PC AT neatly solves the problem by adding a second interrupt controller. Intel designed the 8259A to be cascadable, allowing one to be hooked to another. The missing definitions among the original eight interrupts have been formalized, while the second chip handles additional tasks, such as the 80287 math coprocessor, the real-time clock, and the new hard disk controller. Four of the new interrupts have been labeled "reserved."

The second DMA controller extends the old limitations, which were four channels of 8-bit DMA, capable of moving up to 64K bytes at a time. One of the channels on the second chip is dedicated to synchronizing its activity with the first chip. The other three move up to 128K of data at a time in 16-bit words, anywhere within the AT's 16-megabyte address space. This design effectively doubles the throughput for 16-bit I/O devices such as the new hard disk controller.

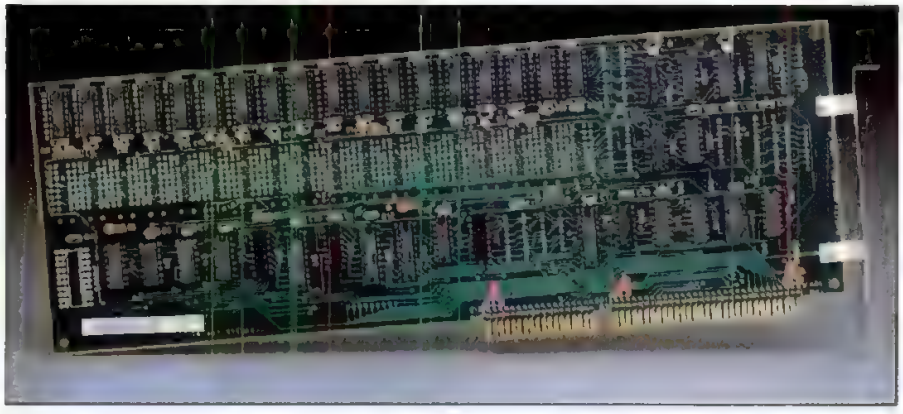
These extensions, as IBM likes to call them, are very much in keeping with the added capabilities of the PC AT. Hardware and software manufacturers alike will have a great time using these new features. —**Bill Machrone**

scrolling, and pokey performance. Once you watch your favorite program accelerate through its normal operation, it's hard to go back to an ordinary PC or PC-XT. Programs run noticeably faster off the AT's hard disk than on a memory drive on the PC or PC-XT. If this machine had wheels they'd be out there reviewing it in *Car and Driver*.



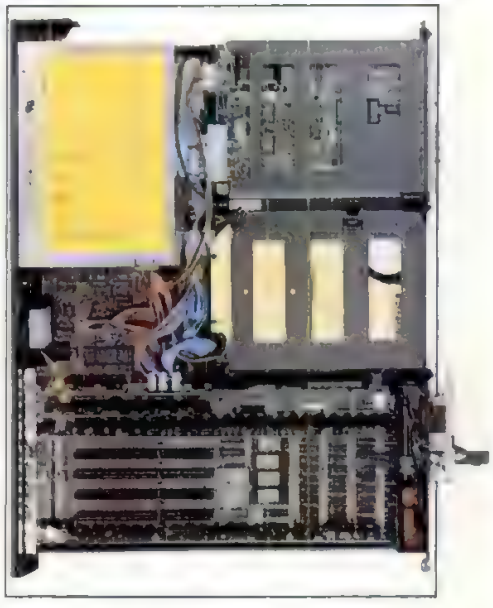
Backup Woes

The AT offers many other advantages over its predecessors. One of the biggest is its ability to salt away well over 40 megabytes of data and access it all in a jiffy. While some fixed disks on the market store more information in the same amount of space, IBM's are blazingly quick—file access is more than twice as rapid as the 10-megabyte snails on the PC-XT. And 40 million characters is a hefty hole for you to pour information into—the equivalent of 20,000 double-spaced pages.



Hard disk backup is still not effortless, but the AT's high-density floppy can store more than three times as many files as standard double-sided 360K floppy disks, reducing the worst-case, 20-megabyte hard-file backup total to 17 floppy swaps. While this total is far better than the 56 it would take with standard double-density floppies, it doesn't hold a candle to the Compaq DeskPro's built-in tape backup. Expect a raft of half-height on-board streaming tape systems for this purpose, first from enterprising third-party suppliers and eventually from IBM.

The AT's high-density floppies add a whole new dimension to micro incompatibility, but they can store 600 pages of text on a single disk, making file portability from machine to machine far easier. However, there is a trade-off—the price for increased storage capacity is another nightmarish situation in which IBM isn't compatible with itself. A high-density drive can read and write standard DOS 2.x, 360K floppies, but, since the tracks on which it writes have to be narrow to



TOP: New IBM Parallel/Serial I/O card comes standard in the expanded PC AT.
LEFT: New AT 128K memory expansion card.
RIGHT: PC AT with cover removed. New Intel 80286 CPU is square chip in center of the motherboard.

squeeze more information in the same amount of space, disks it creates or updates may not work on standard PC or PC-XT drives. AT owners who need to switch disks between ATs and older IBM micros will have to install a matching, beige 320/360K half-height drive in the lower drive expansion slot. But the AT can handle only three physical drives, which means that a second hard disk and a

The Key to Status

The same key that locks up your AT can unlock the door to social success.

'Tis in my memory locked,
And you yourself shall keep the
key of it.
—Hamlet, Act I, Scene iii,

One of the AT's more interesting new features is a lock adjacent to the lacquered gray IBM logo. While most observers simply chalk this off to increased data security, they are missing a critical point: With it, IBM is making an important fashion statement.

Let's say you're a fast-track executive on the make. The dollar-sign key on your AT is already starting to wear out while most buyers are still waiting for their systems to be delivered. There's an ultra-sophisticated *1-2-3* macro named after you. You have Paul Volcker's unlisted modem number at the Fed. But, when you visit the local watering hole after hours to unwind, you're just another cruising Brioni suit.

How do you tell the world you're something special—a fifth-level black-belt AT master? IBM has just made it easy.

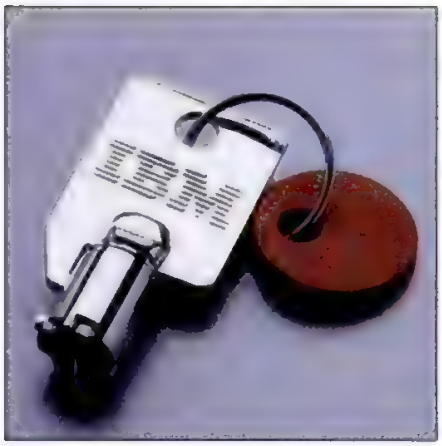
You simply thread one of the two AT keys IBM supplies onto a white-gold chain and drape it around your neck. Doff your Hermes tie, pop your shirt buttons halfway down your chest, amble over to some sweet, young, computer-wise thing nursing a kir, and let the room light glint mercilessly off the letters "IBM" and into her eyes. Franz Mesmer swinging a watch couldn't do better.

The AT-key-on-a-chain is guaranteed to work better than any other dangling talisman currently in vogue—crosses, stars of David, double eagles, Hebrew letters, chromed razor blades, tiny golden fists, coke spoons, dog tags, and more, sometimes worn all at once in a clattery pectoral display. One AT key hanging over your heart puts the others all to shame.

The AT key can also work its magic in the locker room or on the squash court. Right before you climb into your jodhpurs or powder a three-wall shot just out of your opponent's reach, reach down and study the message incised into the back of it: "DO NOT DUPLICATE." You are sui generis, nonpareil, without equal. Unstoppable. They broke the mold. The competition doesn't stand a chance.

If you're uncomfortable about high-fashion singles neckware, you can always twist the AT key onto your pocket keychain and take it out at a critical moment. Closing that crucial deal? Remove the keyring from your pocket in one smooth motion and pretend to use the nail nippers, but make sure the AT key jingles noticeably while you pare the offending cuticle. Or slap the ring noisily down onto a bar or restaurant table to get attention; with the unusually-shaped AT ring prominently displayed you're sure to command respect, even adulation.

Of course, the key has one other



320/360K floppy drive are mutually exclusive. And to compound matters, IBM warns that high-density floppy disks won't work on standard double-density drives.

The single disk controller add-on board can handle two 20-megabyte Winchester hard disks and any two floppies; the single I/O board contains both serial and parallel ports. This arrangement frees up two of half the chassis.

> "How do you tell the world you're something special—a blackbelt AT master? Simply thread one of your AT keys onto a chain and drape it around your neck."

use—it helps define the power structure inside your office. A humming, untended PC or PC-XT is an invitation for someone to come over and start sorting files or rippling through a *1-2-3* simulation. This can be especially galling when the files they're manipulating are yours. The AT locks 'em all out.

Even more terrifying is that when you fill a hard disk with your company's confidential records, it's possible for an interloper with a nut driver to snap off the cover, twist out the hard disk, and walk through the front door with all your firm's sensitive files under his arm. To the security guard it's just a can with a few wires hanging out; to you it's your job, your whole future, down the sewer. But not with the AT. To pry the cover off you need the sinews of a Schwartzenegger and a crowbar the size of your leg.

The key itself is manufactured by the Chicago Lock Company, an old-line Midwest outfit that holds the patent on this ultra-secure round key usually found on pinball machines, jukeboxes, burglar alarms, and Manhattan apartment doors. Referred to in the trade as a "tubular lock," the mechanism was dreamed up by CLC founder Lyle Schinn in 1934.

IBM likes the lock because it offers the maximum security in the smallest physical package available. The smaller the lock, the harder it is to make it exotic. IBM wanted something that wasn't flimsy and easy to defeat, but didn't take up

A typical lock, like the one in most desks, has about 225 "key changes" or tumbler combinations. Chicago's tubular lock has thousands. And it's difficult to copy. Any locksmith can grind out duplicates of conventional keys, but it takes special machinery to produce tubular ones.

Still, IBM has finally come up with the perfect fashion accouterment. Put away your anachronistic Phi Beta Kappas, your passé Playboy keys, the Siegel to the executive washroom, or the Medeco that gets you into the corporate pied-a-terre. This clearly is the status key. Expect a chainful of imitators from the likes of Apple and AT&T before long. —**P.S.**

the eight slots, leaving six for expansion. One additional slot must be filled with a display driver. The unused slots, five of which have an extra socket for 16-bit addressing, can be stuffed with memory, an SDLC or binary synchronous commu-

"A new setup program on the AT stores the important system configuration data in 64 bytes of nonvolatile, battery-powered, CMOS memory."

Goodbye, Mr. DIPS

New AT owners will be relieved to find out that the machine has no DIP switches—it uses a set-up program instead.

One of the most frustrating jobs for many PC and PC-XT users is resetting the pair of DIP switches deep inside the bowels of their computers each time they decide they want to reconfigure their systems.

The switches are tiny, poorly labeled, hard to see, and difficult to manipulate. IBM located these switches in a canyon of boards and drives under such a thicket of cables that switch setters often feel like tropical explorers slashing through the liana. And moving the minuscule pieces of plastic back and forth can be nerve-wracking; some scientist out there may have a long, strong, skinny tool with a grain-of-sand light bulb at the end of it, but it's not on the rack at my local computer store.

These switches tell the computer how many disk drives are attached, whether an 8087 is in its socket, how much memory is on the motherboard, and what display mode to use as the default. Set one wrong and your system will probably work erratically—or it may not work at all. And it's far too easy for novices to flip the wrong switch, or to dislodge a cable in the process.

One Big One

The AT has none of these problems. It has only one switch—for selecting the default display—and it's large, isolated, and easy to find. All of the other settings are handled by a new setup program on the AT diagnostics disk that stores the important system configuration data in 64 bytes of non-volatile, battery-powered, CMOS memory.

The setup program prompts you for the time and date, the number of drives and their sizes and "types," the amount of memory installed both on the motherboard and on any expansion boards, and which monitor is the primary display. Once you enter all this information, the battery-powered RAM retains it even when the main power switch is turned off. If new memory or drives or displays are later attached, you simply have to rerun the diagnostics/setup program and indicate the change.

From Switches to Chips

All of this magic is performed by a new Motorola Realtime Clock/Complementary Metal Oxide Semiconductor (RT/CMOS) chip and powered by a 6-volt, long-life lithium battery pack. The battery comes from the factory unplugged; you have to attach the wires hanging out of it to a connector on the system board. The clock uses the lower 14 bytes of the chip's 64. The rest of the memory is dedicated to storing the configuration data and checking what it detects is in the system against what has been stored. And it's smart enough to recognize when a time and date are valid or invalid and whether the default monitor setting matches the actual hardware in the machine.

The clock boasts many slick features,

nications adapter, a cluster adapter, or a network adapter.

Some of IBM's older cards, such as the color/graphics adapter, have "skirts" that extend the active part of the printed circuit board below the normal lower edge. Because of the way the additional 16-bit sockets have been arranged, such skirted boards will fit only in the two of the eight slots not configured for 16-bit memory addressing. This, however, will undoubtedly be remedied as new, more powerful boards replace the old ones.

IBM is offering half-megabyte memory expansion cards, and third-party vendors are hinting that they'll soon release 4-megabyte AT memory add-on boards populated with 256K RAM chips. These boards can add up to a whopping 16 megabytes or more of RAM, which can be used either for multitasking—loading in all your application software at once—or as an immense virtual drive.

One of the most popular add-ons for the PC and PC-XT is the multifunction memory board, a hybrid printed circuit card that combines additional RAM with parallel and serial I/O ports and a clock calendar. The Enhanced AT has all these features built in. Its 512K of 16-bit addressed motherboard RAM is plenty for many users, and IBM will be happy to provide an additional 128K on a 16-bit board (already drilled and soldered for more). All system memory is parity checked. A clock and calendar are built into the system, and the Enhanced AT comes with its own parallel and serial card.

The motherboard is crawling with 64K RAM chips, piggybacked into 128K modules. The AT is a superbly engineered and constructed machine, but this design is a kludgy way to handle RAM. In keeping with the rest of this state-of-the-art machine, IBM probably should have installed 256K RAMs instead of four times as many 64Ks. While 256K RAMs are not yet common, neither is the 80286. The designers probably chose the smaller chips to keep the cost down.

IBM has two tricks up its sleeve to prevent excessive down-time. The internal

"The AT is superbly engineered and constructed; but its motherboard, crawling with 64K RAM chips, piggybacked into 128K modules, is a kludgy way to handle RAM."

such as the ability to operate under Daylight Savings Time or Standard Time and in 12- or 24-hour cycles (the defaults are Standard Time and a 24-hour clock). It also comes with a built-in alarm although there is little documentation on this. The clock even devotes a byte (&H33) to the setting of the current *century*—IBM must have some really long-term plans for this machine.

Programmers and practical jokers who want to read or write to this memory can easily do so through ports &H70 and &H71. To write data to the CMOS RAM, first key in OUT &H70, ADDRESS and then OUT &H71,VALUE. The addresses and values are listed starting on page 1-45 of the AT's *Technical Reference* manual. To read what is currently stored in this memory, first type in OUT &H70,ADDRESS followed by IN &H71. This process will give you a byte's worth of information; you'll have to mask out or otherwise extract the necessary bit data yourself.

One of the more interesting values in the *Technical Reference* listing is in the table of hard disk drive types. Of the 15 possible hard disks, the version *PC* examined was type 2, which has 615 cylinders and 4 heads and formats to 20 megabytes. Type 9 is listed as having 900 cylinders and a whopping 15 heads, which suggests that IBM may soon be offering a massive hard drive with far more storage than the current version.
—P.S.

"The AT is a marvel that will be the basis of many IBM upgrades over the next year or two."

fan is attached to a thermostat that detects potentially destructive heat buildups and increases the flow of cooling air. And the entire machine has a full-year warranty rather than the usual 90 days of coverage. Added to IBM's deserved reputation for support and reliability, this warranty deflates most reservations about buying such new technology. It also infuriates avaricious dealers who were counting on fat first-year repair bills to further pad their nests.

Showing Its Colors

IBM has also designed virtually all of the AT's optional features to be user-installable, from the 256K memory module kit for the less expensive version, to the 4-MHz 80287 math coprocessor, to the additional floppy or hard drive. IBM provides a dark plastic "decorative rear panel" to dress up the back of the machine. This panel seems silly; the AT is so well designed and put together that, the octopus of internal cables notwithstanding, it would look just fine in a shell of clear lucite. Even the details are handled well, such as the trim, free-standing rack of long-card supports in the AT. (Think of the rickety plastic snap-ons inside the PC and PC-XT.)

As important as what IBM did announce for the AT is what it didn't announce—at least initially. The official IBM dealer's guide shows photographs of seven AT systems, and only one of these at the very end has a squinty mono monitor attached. The others all sport IBM's 2-year-old RBG monitors. It took 3 weeks for IBM to announce its new slate of high-resolution color cards and screens (see the first page of the PC News section in this issue). These late arrivals round out the AT into a true state-of-the art machine.

"How Fast Is It?"

"These tests show that the PC AT is so fast . . ."

Sooner or later, it's time to stop talking about how fast the PC AT is and put it through its paces. Below, we've subjected it to a variety of tests that measure both processor execution speed and file access times. For comparison, we put it up against a standard PC-XT, an AT&T PC 6300, and a Compaq Deskpro. The latter machines are two of IBM's most significant competitors.

The first test, a BASIC program, executes an empty loop 10,000 times.

The next test checks the load time for a 100K text file. We used *XyWrite II*, which uses all available memory for a file.

The third test creates a file of twenty 1,024-byte records 10 times, and the fourth test reads the same file back in. Both of these tests are in compiled BASIC.

The fifth test simply sorts one thousand randomly generated words of from 1 to 10 letters, using the DOS sort utility. The final test uses Lotus's *1-2-3* to recalculate a spreadsheet of 500 by 14 cells.

As you can see from the results, the PC AT is clearly a fast machine. It belongs in the first rank of desktop computers. Is it so fast that you need to rush out and buy one? Let your application be your guide.—**Bill Machrone**

Test	Computer				
	PC-XT	PC*	AT	Deskpro	AT&T*
Count to 10,000	0:10	0:10	0:04	0:03	0:04
Load 100K File	0:04.9	0:10.9	0:02.4	0:03.6	0:11
Write Test	0:16	2:35	0:08	0:19	2:36
Read Test	0:10	1:28	0:08	0:09	1:27
Sort 1,000 Records	1:04.3	1:07.8	0:27.3	0:36.2	0:39.9
Recalc Spreadsheet	4:01	4:01	1:36	2:08	not tested

*With floppy disk

IBM also neglected to release a new printer and, in fact, officially supports only two for the AT, both dot matrix: the 80 cps (Epson) IBM Graphics Printer and the 200 cps (IDS) IBM Color Printer. This short list seems a bit absurd to me, especially in light of the impressive new generation of printers *PC* is testing for an upcoming mammoth printer-roundup issue. Dot matrix printers such as the Toshiba 1351 run circles around the Epson/PC; other fully-formed character and laser printers are far better suited to the needs of the AT user than the mediocre ones sold under the IBM label.

And, not all existing IBM hardware will operate on the AT. The list of proscribed IBM parts includes the current Asynchronous Communications Adaptor, Binary Synch Communications Adaptor, SDLC Communications Adaptor, Parallel Printer Adaptor, Expansion Unit, Memory Expansions, Compact Printer, and non-AT keyboards, disk drives and hard disks. In addition, IBM admits that only 75 percent of the third-party software it tested would work on the AT. But this situation should change as manufacturers scramble to make their products compatible.

However, it is clear that IBM is in the race for the long haul and equally clear that the AT will be its main box for the foreseeable future. The AT is an ultra-high-performance technological marvel that will serve as the basis of many IBM upgrades over the next year or two. As a standalone workstation it's unbeatable. The competition might just as well make and sell toasters.

One of the AT's most highly touted abilities is multitasking. While it's true that under MicroSoft XENIX, users can tie a whopping two computers to an AT (soon to be expanded to 15, according to several sources), who in the world is going to bite? IBM is doing the same thing to XENIX that it did originally to CP/M-86—offering it at a high price and not making it sound very good. Every time reporters at the New York product introduction asked an IBM spokesman a question about XENIX they received such a cold shoulder they didn't need air conditioning in the room.

IBM would rather sell its broadband LAN, which strings together up to 72 users over a 1,000-foot radius, boasts a sophisticated collision-detection mechanism, and supports data transmission rates of up to 2 megabits per second over coaxial cable. This new PC Network (see "IBM Nurtures a Network," this issue) is based on one IBM PC Network Translator Unit and individual PC Network Adapters in each PC, PC-XT, or AT. Each translator can be linked to an IBM PC Network Base Expander hooked up to 64 other IBM micros or compatibles.

Only PCs with new improved ROM BIOS can plug into the network. To find out whether your system needs a new BIOS chip (BIOS Update Kit #1005), load BASIC, then type in and run the following program:

```
10 DEF SEG=&HF000
20 FOR X=&HFFF5 TO &HFFFF
30 PRINT CHR$(PEEK(X));
40 NEXT
```

If you see a date of October 27, 1982, or later, your computer can plug into the network without any changes; if it's earlier you'll have to buy the Update Kit. Another way to check is by examining your PC's serial number. If it's lower than 300960, you have the old, inferior BIOS.

Total World Domination

IBM is seriously gunning for the business market. Not just a big piece, either. It wants the whole ball of wax. And the AT is the right vehicle. It's priced right, and its performance is head and shoulders above the others. In its primary dealer support literature, IBM counts off the reasons why everyone should buy it. For first-time users, there's "ease of use, upward growth capability, IBM reliability and service, [and] state-of-the-art technology." For "experienced users who require increased function and who have an existing investment in IBM hardware and software" there's "processing speed, high performance numeric processing, multitasking potential, large data storage capability, I/O expansion capability, [and] interconnectivity and networking."

IBM has similar arguments for large volume data processing customers, industry-specific market segments, advanced word processing and sophisticated spreadsheet users, professionals who need to provide fast customer service and/or manage a large database, businesses and professionals needing vertical applications and/or large database applications, professionals who require high performance for numeric processing, and business departments with high-volume data entry requirements. That about cover it all? IBM hopes so.

Competitors Whistling in the Dark

Competitors who dismiss the AT as an overexotic multi-user machine in a land of standalone users or as just a jazzed-up PC-XT are whistling in the graveyard. Speed and power are the name of the game, and the AT has both—in spades. The price is reasonable, almost too much so. Who is going to wait 10 minutes for a PC-alike to get an important job done when the AT can do it in 3?

What will happen to the legions of PC lookalikes? This innovative machine is so good that IBM is shooting fish in a barrel. With a cannon. If any competitor other than resource-heavy AT&T and perhaps management-skilled Compaq survives this tsunami, it deserves to prevail. Otherwise it's just a two-way battle between the communications giants. IBM has done it again. You have to give it credit—and hope some other company will have the persistence to stay in the game long enough to keep prices low and technology hopping. ■

IBM
IBM
IBM
IBM

COVER STORY • BILL MACHRONE

IBM NURTURES A NETWORK

Networks are for sharing—files, printers, plotters, hard disks. Does IBM bring anything new to the relationship? Yes: PC Network has more power than anything we've seen yet.

Photograph: Shig Ikeda

"PC Network is a real network. It connects up to 72 PCs in a 1,000 foot radius via broadband coaxial cable."

IBM's new PC Network may be the best network *PC* has ever seen. It's uncharacteristic for *PC Magazine* to get excited about an undelivered product, but there's sufficient justification this time.

PC-compatible networks are barely a year old. PCNet, ShareNet, EtherSeries, Omninet, and others were the pioneers that defined the basic services available to networked PCs (see "Battle of the Network Stars," *PC*, Volume 2 Number 6). In the past year, roughly 20 entrants have joined the fray. IBM even came out with a product, the PC Cluster. It was so tepid that IBM declined even to call it a network.

IBM's new entry is dramatically different. Although the network has been announced, it won't be available until the first quarter of 1985, probably by the end of January. This report is based on IBM's published specifications and technical documentation for the network, as well as some limited hands-on experience at its press introduction.

For starters, I'd like to say that PC Network is a *real* network. It connects up to 72 PCs in a 1,000 foot radius via broadband coaxial cable. With broadband amplifiers and equipment available from cable television vendors, the system can interconnect up to 1,000 PCs and can extend over several miles. PC Network doesn't require a dedicated server. Machines designated as servers can also be user workstations while they are sharing resources with other machines on the network.

Data packets on PC Network zip around at a 2-megabit-per-second clip. While not the fastest (3Com's EtherSeries is rated at 10 megabits), 2 megabits is certainly fast enough to access files over the network at hard disk speeds. When the network is served by a high-performance machine like the PC AT, you would have a tough time telling the difference between a file accessed over the network and one from a local hard disk.

Although the network was introduced at the same time as the PC AT, it is not dependent on the AT. It can be implemented with any mix of PCs, ATs, XTs, or Portables, as long as at least one node is equipped with a hard disk. Obviously, the network will perform better with a machine of the AT's caliber, but any hard disk PC will do. Remote hard disks appear as additional drives on local machines. The network permits remote printer access as well.

Dynamic Duo

Two things make this network go—IBM's Network Adapter Card and the *PC Network Program*. Together, they include a collection of state-of-the-art features unavailable in their entirety from any other source. IBM codeveloped the network card with Sytek, Inc., a Mountain View, California, company that specializes in broadband networks. The card packs an enormous amount of on-board intelligence, relieving the computer of most mundane chores involved in running a network.

The *PC Network Program* runs under DOS 3.1, a version identical to DOS 3.0 except in that the commands for networking are functional. Specifically, it implements file sharing and read-only protec-

PC Network
IBM Entry Systems Division
P.O. Box 1328
Boca Raton, FL 33432
(800) 426-3333
List Price: PC Network Adapter, $695; Translator, $595; *PC Network Program*, $75; cabling, $39 to $99.
Requires: PC, PC-XT, or PC AT with 256K RAM for all features. One machine in network must have hard disk.

CIRCLE 743 ON READER SERVICE CARD

tion of files. It also gives you password control over specific drives and files. The password protection even extends to the print servers. The machines designated as file servers can be print servers as well; but a hard disk is needed to spool print jobs.

IBM didn't stint on print resources: each file or print server can share up to three DOS print devices, and the queue for each can be up to 100 files deep. As you might expect, IBM included software to manage the queues. Actual printing takes place in background mode and does not interfere with normal system operations.

Using the *PC Network Program* is a pleasure. Like most other networks available for the PC, it is a simple, logical extension of regular DOS commands. It also gives you a full-screen operating mode with menus, a message editor, and limited windowing. These features make the network's functions easy for the non-proficient user. Those with more experience will probably prefer to use the command line interface and call network commands from the DOS prompt. The documentation points out that the full-screen interface can be run as an application program, so it is likely that *TopView* users will find it convenient to reserve one task as a window onto the network (see "The TopView Phenomenon" in this issue).

One of PC Network's unique features is that every node carries a name of your choosing, such as "Bill's AT" (wishful thinking) or "Server 1." You use these names to steer data and print files around the network, as though it were a DOS directory name. You can also use these names to send messages to other users, a rudimentary electronic mail capability.

The *PC Network Program*'s features are modular and configurable, starting with the "redirector" function. In this mode, you can redirect file I/O requests and print requests out to a server machine. The remote resources behave as if they were attached directly to your machine.

The next level, "receiver," allows your machine to receive network messages and to route them to the console, a file, or the local printer. The machine receives messages at the same time as it executes local programs.

The "messenger" level adds a full-screen editor to these functions and allows you to forward messages to multiple users. You can switch between the application and the full-screen network mode.

The top level is "server," at which your machine can also share its disk and print resources with other users on the network, concurrent with local application programs. This layered approach gives you, as system designer, easy control over the power granted to each user. Also, inexperienced users needn't be baffled or intimidated by network functions that they don't need to know about.

Hardware Heaven

The software features of the *PC Network Program* are impressive enough, but

Figure 1: PC Network offers these functions from the DOS command line. They are also available to the casual user through menu-driven screens. This relatively simple set of commands controls all the network functions.

Command	Function
NET START	Start up one of the four Network Program configurations
NET SHARE / NET USE	Share and use network resources
NET PAUSE / NET CONTINUE	Suspend and resume network operations on a machine
NET SEND	Send a message(s)
NET LOG	Log message(s) to display, printer or a file
NET NAME	Add a name to a machine for receiving message(s)
NET FORWARD	Forward a name to another machine so that message(s) can be received there
NET PRINT	Print a file on a network printer or get status of print queue
NET SEPARATOR	Define a separator page to be printed between print files on a print server
NET ERROR	List the network error log
NET FILE	List the current users and current record locks for a file
MODE	Set the character and line spacing of a network printer
PERMIT	Standalone single-session version of the file server

The best values always come from a name you can trust.

SOFTWARE

Alpha Software
Alpha Base V $329
ESP 529

Ashton-Tate
IBM/PC Reference Encyclopedia ..... Call

ATI
All Training Prog's. ea $ 49

B&L Multi-job (runs 9 prog's at once) $145

Cdex
All Training Prog's. ea $ 49

Central Point
Copy II PC ..... $ 34

Common language systems, inc.
PLAIN ENGLISH $499

CompuView
Vedit CP/M 86 ..... $130
Vedit 130
Systran 99

dBASE II CORNER

Anderson-Bell
Abstat $289

Ashton-Tate
d-Base II ..... Call
d-Base III ..... Call
Framework ..... Call
Friday ..... Call

Better Business Solutions, Inc.
dBase II Writes Checks ..... $ 75

Data Based Solutions
dNAMES ..... $ 95

Fox & Geller
dGraph $169
Quick Code 169
dUtil 58

Global Technologies
dbLINK ..... $ 69

Human Soft
dBase Plus ..... $ 85

Sensible Designs
dProgrammer $199

Software Banc
Advanced d-base II User's Guide ..... $ 27
Report Writing w/ purchase of dBase II ..... $ 10

Software Research Technologies
dFastest ..... $ 75

(All above available on PC-DOS.)

Continental/Arrays, Inc.
Home Accountant ..... $ 95
Small Business Acct. 155
PC Combo Pak (Tax Advntg/Home Acct't) $169
Ultrafile 149

Decision Resources
Chart-Master $255

Digital Research
Concurrent CP/M 86 ..... Call
CP/M-86 ..... Call
Pascal MT+ (PC DOS) Call
C Basic 86 ..... Call
C Language/compiler. Call
DR Graph ..... Call
Personal Basic 86 ..... Call
PL/1-86 ..... Call
Others ..... Call

Dow Jones
Market Analyzer $229
Market Manager 189
Spreadsheet Link 179
Investor's Workshop 95
Home Budget 89
Straight Talk ..... Call

Ecosoft, Inc.
Microstat $259

Emerging Technology
Edix (editor) $139
Wordix (formatter) 139
Both 269

Enertronics
Energraphics $259
w/ Plotter Option 299

Fastware
Thor (the thought organizer) $245

Financier, Inc.
Financier II $119
Tax Series 105

Fox & Geller
Grafox $189
R-Graph (for R-base 4000) $175

Harvard Associates
PC Logo $129

Harvard Software
Project Manager $249

Hayes
Smartcom II ..... $ 95
Please ..... Call

Heritage
Smartkey II ..... $ 65

HyperGraphics Corp.
Authoring Graphics $299
Presentation Graphics 279
Object Libraries:
Computer Aids ..... $ 49
Maps 49
Borders 49

LOTUS 1-2-3 CORNER

Programs for your LOTUS 1-2-3

Consumer Software, Inc.
"Auditor" (proofing tool) ..... $ 85

Lighthouse Software
Key II (Data Mgmt for 1-2-3) $149

National Training Systems, Inc.
Putting 1-2-3 To Work (8 application templates on diskette) ..... Call

Phoenix Consulting Group
3Plus (Fin. Planning, Forecasting) ..... Call

Softsell
Templates, diskettes Call

Strategic Software Systems, Inc.
Bottomline V $195

Whiterock Alternative
The Organizer (quickly access files thru branching tree system) ..... $ 79

Trillian Computer
Visuall Plus ..... $ 79
w/ All Shells 119

Individual Software
Prof. DOS ..... $ 47
Prof. Pixel 47

Innovative Software
T.I.M. IV $275
Fast Graphs 229

Living Videotext
Think Tank (256K) $139

MDBS, Inc.
Knowledge Man $299

Metasoft
Exec. I (WP, Admin., Data Mgmt, Speller) $395
Telecom 125

Micro Pro
Wordstar $250
Starburst 109
Pak (WS, MM, SI, CS) 359

Microrim
Report Writer $119
R:Base 279
R:Base Clout 129

Microsoft
MuMath/MuSimp $179
Pascal Comp (DOS) 229

Microsoft *(cont'd)*
Project Mgmt 199
C Compiler (DOS) 309
Basic Compiler (DOS) 249
Multiplan MS/DOS 129
Word 229
Word w/ Mouse 299
Others ..... Call

Microstuf
Crosstalk $109

Morgan Computing
Professional Basic $299
Trace 86 99

Mosaic Software
Super Chartman II $299
Chartman IV 199
Both II and IV 350
Integrated 6 369

Multimate Systems Inc.
Multimate (WP) 269

North American
Answer (Database Prog.) $159
Memory Shift 79

Northwest Analytical
Statpak $365

Oasis
The Word Plus $110
Punctuation & Style 99

Open Systems
Acct'g Programs $429
Buy 3 or more @ 419

Opt-Tech Data Processing
Sort (a file containing 4000 records of 128 bytes each can be sorted to produce an address file in 30 seconds) ..... $ 79

PC Innovations
PC RESET (push-button operated direct system reset) ..... $ 42
Remote Control Assembly ..... $ 29

PC Software
PC Crayon ..... $ 36

Peachtree Software
Back to Basics Acct'g System $219
Home Software Library ..... Call
PeachPak 4 (GL, AP, AR) $249
Series 8, ea. mod 389

Peter Norton
Utilities ..... $ 55

PowerBase Systems, Inc.
Power-base w/ DATAZOOM $325

PCjr.

Please call us regarding products for the IBM PCjr.

Prentice Hall
VCN Execuvision $299

Redding Group
Graph Talk $339
Synch (2780/3780) 379

SPI Open Access $379

Satellite Software
Word Perfect w/ Sp. $255
Others ..... Call

Softcorp, Inc. PRO-JECT 6 (Complete Critical Path Mgmt Syst.) ..... Call

Softcraft
Fancy Fonts $125

Software Arts
TK! Solver $265

Software Publishing
PFS: Report/Access ..... $ 79
PFS: File, Graph, Write 89
PFS: Plan 99

Sorcim ..... Call

Star Software
Legal Timekeeping, Billing & Accts $695
Accounting Partner 269

Supersoft
Fortran IV PC/DOS or 8086 ..... $279
8087 Support 40
Others ..... Call

Wang/Aspen
Grammatik ..... $ 60
Proofreader 42

Warner Software
Desk Organizer (clears desk of 7 bus tasks) $219

Woolf Software Systems
Move It (PC to CP/M and PC to PC) ..... $ 79

...and many more!

GAMES

Automated Simulation, Armonk, Avalon Hill, Blue Chip, Broderbund, Data Most, Infocom, Spinnaker Software, Sierra/On-Line, Sublogic, Weekly Reader, Xerox ..... Call

BOARDS

DISPLAY CARDS

Amdek
MAI Card $420

Fredericks/Plantronics Colorplus .. $399

Hercules
Graphics Board $339

MA Systems
Peacock
Clr Board..... $249

Paradise/USI
Display Card
(clr/monochrome). $379

Quadram
Quadcolor I..... $199
Quadcolor II..... 389

Tecmar
Graphic Master $479

AST Research
Six Pak Plus 64K (S&P, Clk, exp to 384K)..... $279
MegaPlus 64K, (Cl/Cal, S Port, 512K cap w/ Megapak)..... $279
Extra ports for Megaplus and I/O Plus II (Game, P/S)..... $ 40
Megapak 256K exp... Call
I/O Plus II
(Cl/Cal, S Port..... $159

New AST to IBM Mainframe connection now available:
5251 - SNA - BSC - 3780 - PCOX..... Call
Monograph Plus ..... Call

PC NETWORKING

AST Research
PC 002 NET
Starter Kit..... $899

Orchid Technologies
The Orchid Blossom (to 384K, Clk, w/ alarm, S&P ports, ram disk & disk coching, upgradeable to PCNet)..... Call

Quadram..... Call

Santa Clara
Starter Kit $1245

X-Comp X Net
(2 bds, 2 users)..... $829
X Net exp bd.. ea 429

Add'l Networking
Products..... Call

Maynard Electronics
Floppy Drive Cntrlr.... $169
w/ Par Port..... 219
w/ Ser Port..... 229
Sandstar ..... Call

Orange Micro
Mr. Chips..... Call

Quadram
Quadboard 64K, (exp 384K, Clk/Cal, S&P Ports, Software..... $269
Quadboard 384 (0K) . 239
Microfazer Stack Printer
-P/P 8K..... $139
-S/P 8K (exp 64K only) 149
-S/S 8K (exp 64K only) 149
Quadlink 64K Memory allows Apple SW to run on IBM/PC)..... $469
All Other Products .... Call

Purchase a SINGLE Board and SAVE SPACE for future expansion!

by

INNOVATION/ Bronson Electronics Corporation

"Innovation CGP"

- Full color graphics capability.
- Single or double-dot character fonts
- Parallel printer port.
- Fully compatible with IBM PC/XT, Portable and look-alikes
- Compatible with all IBM hardware
- Compatible with all color graphics software for IBM PC, XT, Portable (including Lotus 1-2-3).
- One year warranty.

ORYX Price..... Call

MONITORS

Amdek
300A Amber $149
Color II +..... 429

NEC
JB1201-12" Green..... $169
JB1260-12" Green..... 119
JC1216 RGB 429

PGS
HX12 RGB Color..... $489
MAX 12..... 189
SR12 (690×480 Res)... 639
Doubler Cd (SR12)..... 175

Quadram
Quadchrome $489

Sanyo
8112 12" HR Green.... $195

Taxan
KG12N-UY 12" Am.... $129
KG12N 12" Gr..... 132
RGB Vision-1 12" Clr.. 319
RGB Vision-3 12" Clr.. 449

USI 1200A
12" HR Am..... $139

MODEMS

Hayes
Smartmodem 300..... $205
Smartmodem 1200 .... Call
Smartmodem 1200B... Call

Microcom, Inc.
Era 42 (1200 int baud) $395

Novation ..... Call

Quadram Quadmodem (Stand alone, full 212A, compatible w/ Quadlink SW..... $529

US Robotics
Auto-Dial 300/1200 ... $459
S-100 Modem..... 349

Ventel
300-1200 baud Modem w/ Crosstalk for portables..... $459

DISK DRIVES

CDC 1800 ..... $199

Corvus HD ..... Call

Datamac
Trustor 10H..... Call

Davong HD..... Call

I-Omega
Bernoulli Box
(10 MB removable)... Call

Santa Clara HD ..... Call

Tandon TM-100-2..... $199

Vista
Dynaframe Systems
w/ 5-40 MB Primary
Disk Drive..... Call

PRINTERS

Dana/Abati
LQ-20P..... $429

Diablo
630 ECS..... Call
630 API..... Call

Mannesman Tally
MT180L..... $799
MT160L..... 569
Spirit..... 299
420L..... Call
440L $2399

NEC 3550..... $1625

Okidata 82-93..... Call

Quadram Quadjet... Call

Siemens Ink Jet
Printers PT88..... Call

Star Micronics..... Call

Teletex T1014..... $499

...and much more.

CHECK HOLIDAY SPECIALS IN THE NEXT ISSUE AND ORDER EARLY TO ENSURE DELIVERY

DISKETTES

3M 5" DS, DD Box ... $ 35

CDC ..... $ 28

Maxell 5" DS, DD MD2 Box..... $ 32

Spectrum 5¼" DS, DD (Box/10)..... $ 29

Ultramagnetics
5" DS, DD, Box ..... $ 32

Verbatim
5" DS, DD, Box ..... $ 32

(3 Boxes Diskettes Min.)

PLOTTERS

Amdek
DXY-100..... $599
Amplot II..... 899

Enter
P100 Sweet P..... $545
Sweet P Six Shooter... Call

Houston Instruments Call

Panasonic
Digital Plotter
VP6801P..... $1375

MISC.

Alpha-Delta "MACC"
Surge Protector ..... $ 69

American Tourister
Protective cases for computers, printers... Call

Computer Accessories
Power Director (surge/transient protection, EMI/RFI filtration, integrated power cntrl)..... Call

Flip 'n' File 5¼"..... $ 22

Hauppage
8087 Chip $159
Other Products..... Call

Key Tronic
5150..... Call
KB5151 ..... Call
KB5151 Dvorak..... Call

Microsoft Mouse..... $155

Mouse Systems
PC Mouse..... $159

PMC Industries, Inc.
Surge/Power Protectors..... Call

RH Electronics, Inc.
Guardian Angel (200 watt uninterruptable power source..... Call
Power Angel (800w)... Call

Titan Technologies, Inc.
PC Accelerator (plugs in, programs run 2½ to 4 times faster)..... Call

SGL Homalite
Optech CRT filters..... Call

Street Electronics
Echo speech synth for IBM..... $179

Systems Mgmt. Assoc.
PC Documate (comprehensive ref aids).. Call

TG Joystick..... $ 49

Thunderware
Thunderclock..... $126

Valley Craft
Computer Furniture & Data Stations..... Call

Versa Computing
VersaWriter..... $239

A variety of complete PC compatible systems are available at Oryx. For assistance in determining your needs, use our technical line.* We will be happy to provide full support.

POLICY:

- Wisconsin residents add 5% for sales tax.
- Minimum $4.00 for shipping, handling and insurance for orders to $200.
- For orders over $200, add 2½% for shipping, handling and insurance.
- For cash prepayment of orders $200 or more, add *ONLY* 2% for shipping, handling and insurance.
- Foreign — either add 15% handling & shipping (Int'l money order) or inquire.
- Prices are subject to change without notice.
- All items subject to availability.

WE WELCOME:

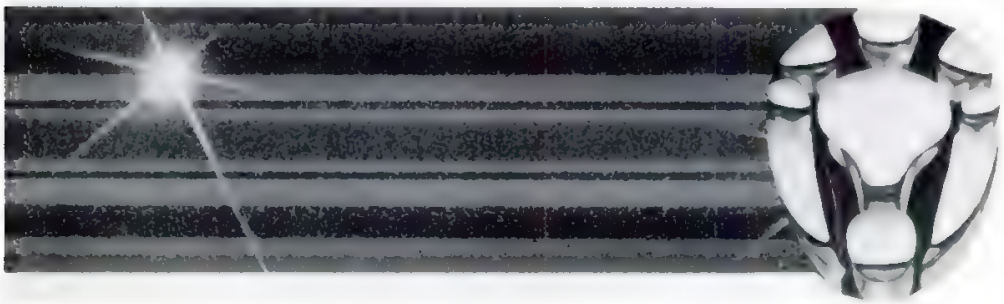
- Visa, MasterCharge and American Express. (No charge for credit cards.)
- Corporate, government or educational volume purchases, please ask for special accounts desk for additional discount. (1-715-848-1374)
- COD (Add $2.00 per box/parcel. Cash or certified check required.)
- Checks. (Allow 1-2 weeks for clearing.)

WORKING HOURS:

Monday-Friday 8:30-6:00 • Saturday 10:00-2:00 • Central Time

CIRCLE 352 FOR SPECIAL OF THE MONTH

CIRCLE 351 ON READER SERVICE CARD



ORYX SYSTEMS, INC.

CRAFTSMEN OF THE NEW TECHNOLOGY

1 800 826-1589

WITHIN WISCONSIN **1 800 472-3535**

425 First Street • P.O. Box 1961
Wausau, Wisconsin 54401

***For tech. support & order status: 715-848-1374**

what really makes them fly is the raw power of the PC Network Adapter. This card clearly raises the ante for capabilities among smart network controllers.

The heart of the card is a 80188 processor, which runs at 6 MHz. An Intel 82586 communications controller and some custom circuitry from IBM and Sytek aid and abet this processor. You might say that this card has more power than a standard PC, and you wouldn't be far off the mark. The difference is that it is dedicated to network functions, not to general-purpose computing. Its 32K of ROM-resident programs includes powerful, high-level network commands. In other networks, many of these functions must be handled by your computer or by the server. The card further increases its speed and holds down host overhead by transferring data via DMA (direct memory access). This technique lets the adapter talk to the network while the host computer runs application programs. The network card interrupts only long enough to transfer a received packet of data into the host's address space.

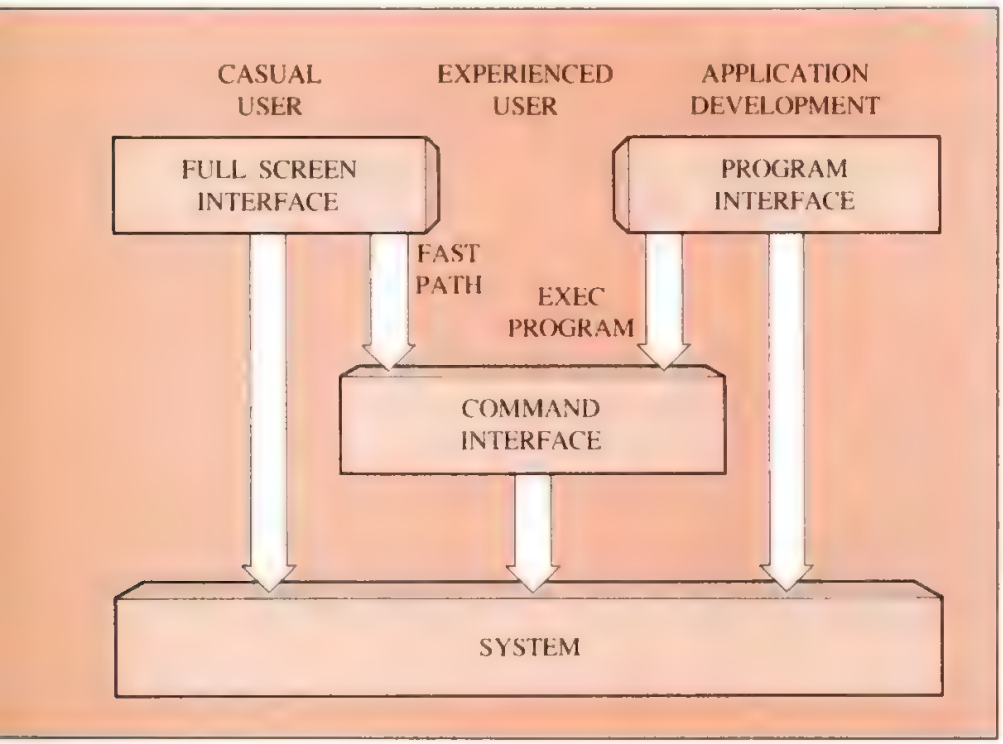
One of the interesting features of the card is that it lacks the usual bank of DIP switches for setting a unique network address. Instead, each card has a serial number burned into a small ROM when it was manufactured. The setup program consults this identification code and uses it when you name your node ("Bill's AT"). This feature, innovative for a network card, will also permit designers to build in ironclad security and copy protection controls.

Like some earlier networks, PC Network permits machines to boot over the network so that they needn't have any disks at all to be functional. This ability is very desirable in some high-security applications where preventing removal of data is important. Another benefit is that, in addition to saving costs, this capability can free the uninitiated user from the complexities of booting the system with a floppy disk.

The software on the program ROM is a full BIOS (basic input/output system) for the network. It has many sophisticated features, such as protocols, name control, and logging in of users. It is interesting to note that the NETBIOS supports up to 32 concurrent sessions on one card, as well as access from multiple operating systems without conflict. IBM's overview documentation states, "There can be multiple names associated with each adapter card and the names are globally known on the network." The mind reels at the possibilities, but the potential seeds for true distributed processing are sown in this card. The programmer's "hooks" for multiple users and multiple tasks are already in place. The documentation explains clearly how to use them.

The PC Network Adapter card also maximizes its own efficiency. It allocates the 16K onboard RAM to assemble and transmit the largest possible packets of information for maximum speed. It auto-

Figure 2: A schematic depiction of the user interface to PC Network. The "fast path" allows the user to bypass menus by giving the desired command. Application programs can communicate directly with the network through DOS calls or can go through the command interpreter.



matically divides memory among multiple users when they are present and reallocates it when users log off.

Ethernet

IBM's protocol scheme is about as close as it can get to Xerox's Ethernet and not be Ethernet. It employs a CSMA/CD (carrier-sense multiple access with collision detection) protocol, pioneered on Ethernet. It uses a broadband cable, permitting other data services and even cable television functions to share the cable at the same time without causing any interference.

Ethernet could have been implemented in cable form with broadband techniques, but it wasn't. In fact, the early research on CSMA/CD was done with broadcast radio communications, not on cables. Coaxial cable came as a later refinement—a way of limiting to a confined space the "ether" through which the electrical signals travel.

IBM has made the decision not to follow some of the standards that were set forth in Ethernet, a flex of corporate muscle toward AT&T and other Ethernet licensees. Since most people probably won't want to mix and match network adapters on the same cabling system, IBM's departure from its standards doesn't really threaten Ethernet's position, especially in some of its more advanced applications such as AT&T's mini-to-micro systems and Xerox's office automation networks.

IBM's broadband system uses two 6 MHz signals (the same bandwidth as a television channel), one to receive data and one to transmit it. The adapter card has an RF modem, an actual transmitter and receiver pretuned to these channels. This scheme requires the use of a "translator" or retransmitter. Its function is simply to take everything it "hears" on the receive frequency and resend it on the transmit frequency. The flow of data on the cable is directional, and the translator ensures that every station gets a full, strong signal.

If you figure that standard 75-ohm cable can easily carry 50 television-like channels, 48 channels are still unused in PC Network. These spare frequencies can be used for teleconferencing, data exchange on nonconflicting frequencies, security monitoring, or standard cable television distribution. Most users of PC Network will never use the cable for anything more than PC-to-PC communications, but to some this feature will be a godsend.

The cabling system that connects the network adapters is the same 75-ohm stuff used for cable television. IBM has a line of products that connects host systems in a network with a radius of up to 1,000 feet. It includes lengths of cable, signal splitters, multiple taps, and the like. The documentation recommends commercial CATV equipment (not by name) as a source of proper signal distribution gear for larger networks. Meanwhile, IBM has neatly divided the cabling options into convenient short-, medium-, and long-distance kits. You can mix and match with relative ease. You won't get into trouble as long as you adhere to IBM's guidelines. At some point, however distant, you'll have to call for technical support from a CATV house to amplify and balance the network.

Conclusions

PC Network is a milestone in local-area networking. It is among the most technologically advanced, the most powerful, and easiest to use networks available. None of these qualities has been strong suits for IBM in the past.

The PC Network shares the PC AT's cutting edge outlook; IBM is packaging and offering the Network in the same open-architecture fashion as the AT, which will make it immediately acceptable to end users and highly attractive to third-party software developers. ■

"PC Network permits machines to boot over the network so that they needn't have any disks at all to be functional."

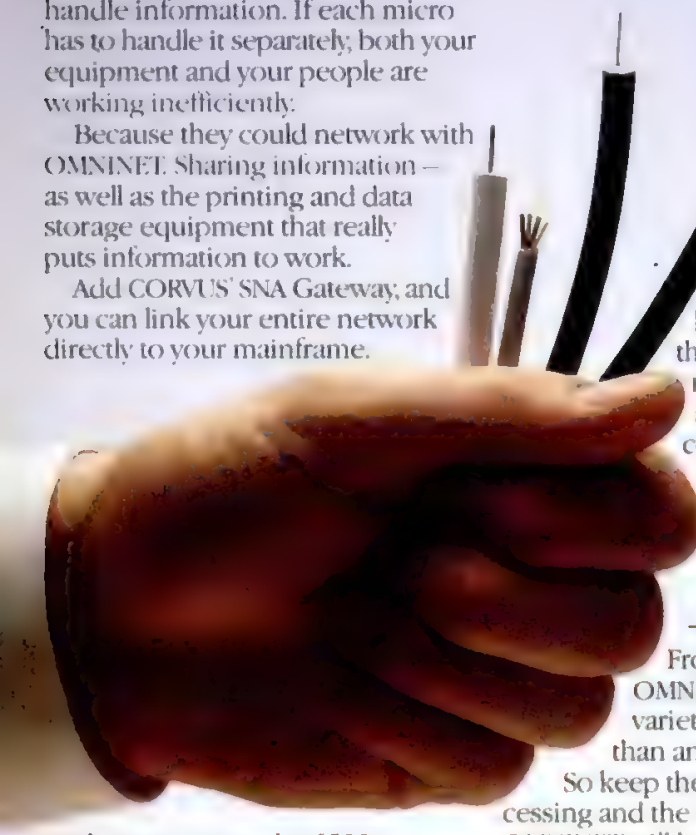
The right network isn't a matter of choice. It's a matter of fact.

Fact: You can't buy smarter than an OMNINET™ Network.

Whether you have 2 microcomputers or 200, you bought them to handle information. If each micro has to handle it separately, both your equipment and your people are working inefficiently.

Because they could network with OMNINET. Sharing information — as well as the printing and data storage equipment that really puts information to work.

Add CORVUS' SNA Gateway, and you can link your entire network directly to your mainframe.



That's why an OMNINET Network uses simple, telephone-type line. Even relocating the system to a whole new building is just a move. Instead of a construction project.

Fact: OMNINET Networks offer unmatched compatibility.

From Apples to Zeniths, OMNINET handles more varieties of computers than any other network.

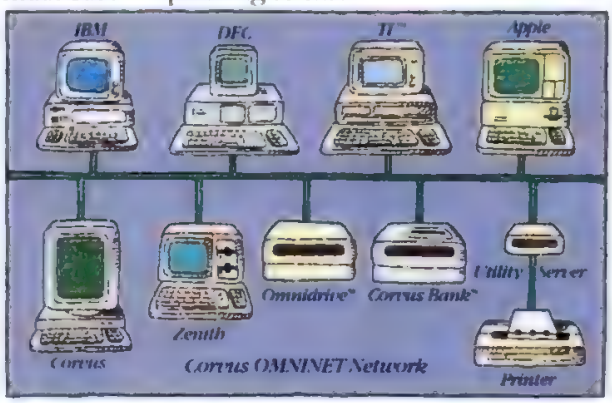
So keep the DEC's in Data Processing and the PC's in Purchasing. OMNINET will keep them all on speaking terms.

The price? At under $500 per hookup, OMNINET is the most cost effective network you can install. Or expand.

Fact: This network was designed for microcomputers.

Micros get moved. Businesses expand.

Your network should be able to grow and change just as fast as your business does.



Fact: The experts network with OMNINET.

Over 30 of the major computer companies have licensed OMNINET for networking their micros. So you don't have to worry about support tomorrow for the system you pick today.

And OMNINET already has the most software options around — over 500 programs to choose from, according to your people's needs. Not their network's limitations.

Fact: The facts have made us #1.

CORVUS pioneered local area networking for microcomputers, and we've never stopped working on ways to improve it.

Just give us a ring at 800-4-CORVUS to find out more.

Because while calling ourselves the best is a matter of opinion, telling you that 3 out of every 5 locally networked micros work on a CORVUS network is something else.*

It's a matter of fact.

CORVUS
The Networking Company.

*59% of all locally networked micros operate in a CORVUS network, according to *InfoCorp*. CORVUS, THE NETWORKING COMPANY, OMNINET, OMNIDRIVE and CORVUS BANK are trademarks of CORVUS SYSTEMS INC. IBM PC is a trademark of International Business Machines. APPLE is a trademark of APPLE COMPUTER INC. DEC is a trademark of DIGITAL EQUIPMENT CORPORATION. Zenith is a trademark of Zenith Corporation.

CIRCLE 124 ON READER SERVICE CARD

A Bridge Between Mainframes and Micros

Cullinet's Information Database package for its GOLDENGATE integrated software promises to be the missing link that MIS departments have been seeking.

Every time I pick up a computer magazine or newspaper I see a plethora of articles by MIS executives lamenting the lack of an effective micro-to-mainframe link. The link they seek is not simple file transfer or terminal emulation. What they want is a way to combine a PC's spreadsheets, graphics ability, and flexibility with the massive corporate databases already extant on their mainframe computers. Cullinet Software, Inc., has attempted to do just that.

Cullinet Software is a leading vendor of software for IBM's mainframe computers. Founded in 1968, Cullinet now boasts over 10,000 product installations worldwide. While you may not think 10,000 is a lot by today's microcomputer software standards, you must keep in mind that these products are on mainframe computers, for which software often costs more than $100,000. Cullinet's particular area of software expertise is databases (it used to be called Cullinane Database Systems). Cullinet's database, *IDMS (Integrated Data Management System)*, is one of the mainstays of the IBM world. *IDMS* is to a

Illustration: Akio Matsuyoshi

microcomputer database what Dave Winfield is to the average Little Leaguer. They both play the same game with the same rules but with great differences in sophistication.

Cullinet's aim is to use its experience in mainframe databases to develop software on the PC that performs similar functions and gives you an effective interface to a mainframe's data. It recently introduced two products to achieve this goal. The first, *GOLDENGATE*, is an integrated software package that includes a relational database manager, a spreadsheet, a graphics system, a word processor, and a communications tool. It uses a common command syntax for all five of these tools and for the second product, the *Information Database*. The *Information Database* is a communications package linking *GOLDENGATE* on the PC to *IDMS*.

I recently had the opportunity to see a preliminary version of *Information Database* at Cullinet's headquarters outside of Boston, Massachusetts. While I was there, Cullinet executives explained to me in depth the concepts behind the software and ran the program through its paces for me. Since the *Information Database* was not to be released until September, and because I am a little shy of showing my maniacal methods of evaluating computer programs in front of other people, I did not give the product a thorough workout.

Information Database
Cullinet Software, Inc.
400 Blue Hill Drive
Westwood, MA 02090
(617) 329-7700
List Price: $75,000 if purchased with *Integrated Data Management System;* $125,000 alone.
Requires: 320K RAM, 5-megabyte hard disk, IBM Color/Graphics Adaptor, DOS 2.0, IBM 43xx, 30xx, 33xx, or 360/370 series mainframe, asynchronous communications adapter.

CIRCLE 735 ON READER SERVICE CARD

The real beauty of IDB is that you never see it; you can use GOLDENGATE in almost complete ignorance of its existence.

However, I got a general feel for how the *Information Database* functions and how it works with *GOLDENGATE*. This information, along with a review of *GOLDENGATE* in the article that follows, "Integration at the End of the Bridge," should give you a good idea of what Cullinet's software is all about.

The *Information Database (IDB)* is the micro-to-mainframe link behind *GOLDENGATE*. This link is what separates *GOLDENGATE* from other integrated software packages such as *1-2-3*. *IDB* runs on IBM 370-family mainframe computers and chiefly works with Cullinet's relational database *IDMS/R*. It does work with VSAM files, and with a little more effort, will work with other vendors' databases as well.

IDB is not itself a database, but rather a front end to the actual mainframe databases. You can look at *IDB* as a card catalog in a library. It contains information showing you where to find different books in the library. The catalog does not contain the item you are looking for, just instructions on how to find the desired item. In a similar manner *IDB* does not contain data; it just knows where the data is. *IDB* goes a step beyond the card catalog; it not only contains instructions for obtaining an item, it goes and gets the item as well. *IDB* obtains the data from the mainframe where it is stored in *IDMS* format, converts it to ASCII format, reformats it for the integrated software package *GOLDENGATE*, and downloads it to the PC. Since you communicate only with *GOLDENGATE*, which translates your requests into a form that the *IDB* understands, you don't have to worry about comprehending the mainframe's way of doing things.

Unlike a library, *IDB* and *GOLDENGATE*, working in tandem, do more than just give access to a fixed store of data; they allow you to manipulate that data and create information. Like *GOLDENGATE*, *IDB* sees data as objects. An object can be a spreadsheet, a graph, a memo, or an entire database. To group related objects together, you store them in folders. Objects and folders are in turn stored in catalogs. When stored on your PC, objects are MS-DOS files and folders are subdirectories; catalogs correspond to storage devices such as drives and hard disks.

You can read and manipulate catalogs and their contents and then store objects back into folders and catalogs, just as readily as if you were storing them on floppy or hard disk. The benefit of storing objects on the mainframe through *IDB* rather than simply on your PC is that you can let other people with access to *IDB* see your objects and easily share the results of your work. You can even store any ordinary DOS file via *IDB*. You can take advantage of the large storage space on the mainframe and, more importantly, have the files backed up by the mainframe. *IDB* even includes a mail facility.

If you think a product that allows you to share files among multiple PCs and has a mail facility sounds a bit like a network, you're right. *IDB* is not a true network because the link is always to the mainframe rather than directly among PCs, but it does have many of the capabilities that people purchase networks for. If a company uses *IDB* it may find it has no need for a network as well.

The real beauty of *IDB* is that you never see it; you can use *GOLDENGATE* in almost complete ignorance of its existence. Except for initially establishing the connection to *IDB* in *GOLDENGATE*, you need use no *GOLDENGATE* commands to accommodate *IDB*. Information within *IDB* looks just like information on your hard or floppy disk. The only way to tell the difference is that remote folders are shown in one color, while local ones are in another. Since *GOLDENGATE* includes a relational database, it is a straightforward matter to combine different databases, whether local or remote.

To take full advantage of the *Information Database*, it often is useful to know what data is local and what is remote. Remote data, such as the corporate personnel database, is often shared with other people, while local data is private. A manager might keep performance reports for employees in a local database. This data could then be joined with such remote corporate data as salary and job descriptions for the same employees, in order to prepare annual raises, for instance. Next, this data could be included in a spreadsheet along with the departmental budget figures from *IDB* to help decide next year's salary for each employee. The final results, maybe in the form of a graph, could then be put in *IDB* and shared with other department heads or the corporate financial officer for inclusion in an annual report. This graph would be immediately available to other viewers, without requiring conversion or manipulation from a spreadsheet format by each viewer.

Lest any corporate chair cringe in fear that vital company data will leak out to every PC in the firm, be assured that *IDB* has security features to prevent unauthorized data access. A database administrator can restrict what data is available to each person. *IDB* gives the mainframe sophisticated means for protecting its valuable, and often sensitive, data. A manager might have access to his or her own department's employee data, but not to that for any other departments.

All this power and functionality does not come totally problem-free. The first problem is performance. One reason that PCs are so popular is that they liberate you from worrying about and contending with the high loads and slow turnaround times of mainframes. Furthermore, since a PC's terminal (its screen) is an integral part of the PC, the time it takes to display characters is minimal. On a mainframe, display can be much slower, especially if, as often is the case, the mainframe computer is in another building or even in another city. Although *GOLDENGATE* and *IDB* let you treat the mainframe's data as if it were stored locally on a hard disk, you will certainly notice a lag if you are in Des Moines and your company's computers are in New York City. If you are what is known in IBM parlance as locally attached (in the same building as the mainframe), the difference is not nearly so noticeable. These performance considerations are not really a reflection on *IDB* but rather on mainframes and their communications.

The most obvious problem is cost. *GOLDENGATE* costs $795 per copy, although Cullinet offers substantial quantity discounts. On top of this, the *Information Database* costs $75,000. Add to this the price of *IDMS/R* and its related products, and the total bill can be very large. These prices are not out of line for mainframe software, but they are still sizable. Furthermore, you must have an IBM PC-XT or an IBM PC with a 5-megabyte hard disk drive and a color monitor just to run *GOLDENGATE*. To use *IDB* you also need an IRMA 3270 emulator board and a connection to a 3274 in order to communicate with your mainframe.

GOLDENGATE costs $795 per copy, although Cullinet offers substantial quantity discounts. On top of this, the Information Database costs $75,000.

My final and most pressing concern is the critical mass necessary to make all this software and hardware work. You don't just buy some software for your PC and go off merrily and work. To really harness the full power of Cullinet's concept, you must first have some corporate data in a database, preferably in Cullinet's *IDMS* database. It should be carefully organized on your mainframe, a prerequisite that implies centralized control, most likely by your corporate or departmental MIS people. While most people would agree that this control is a good idea, it does run counter to the way in which the use of PCs has grown and flourished. Managers have often bought PCs as a reaction against, rather than an extension of, the MIS department. The *Information Database* brings together not only the mainframe and microcomputer, but their respective cultures as well. The benefits derived from this union may be enough to bring this melding about, but it will not be easy.

GOLDENGATE, used in conjunction with the *Information Database*, is a powerful tool. It is not, however, for everybody. Obviously, it is not something that you would use on your PC at home. It is targeted at corporations that have IBM mainframe computers and have, or plan to purchase, hundreds of XT-type computers. The costs are not negligible, but the benefit may be the micro-to-mainframe link that MIS departments have been searching for. ■

Bill Catchings is a systems programmer at Columbia University specializing in PC-to-mainframe integration.

Business or pleasure, we're your one-stop

HARDWARE

AST RESEARCH

AST 6-PACK PLUS multi-function board. 64K-384K expandable memory, clock calendar, 1 serial and 1 parallel port, includes Super Drive and Super Spool software (optional game port adapter available). 6-Pack Plus 64K 269.95
For game port option add 34.95

64K RAM set (consists of 9 pieces) upgrades memory by 64K 49.95
$10.00 *installation fee (per 64K) with purchase of memory board at time of board purchase only.*

CDC DS/DD disk drive 199.95

CURTIS

PC-II Pedestal for IBM monochrome display ***New Low Price*** 39.95
AD-1 Adapter for use of PC-I with Princeton or Quadrome color monitor 7.95
UNI/1 Universal tilt and swivel base for use with monitor 36.95
EC-I 3' monochrome extension cable 36.95
EC-II 3'-9' coiled keyboard extension cable 27.95

8087 Math coprocessor with diagnostics 174.95

DCA INC.

Irma Board 3278 Emulation .. 949.95

IQ TECHNOLOGY

Smart Cable (RS-232C) 79.95
Eliminates RS-232C cable compatibility problems. Please specify male or female to computer.

KEYTRONICS

New! KB-5151 keyboard 189.95

MICROSOFT

New! Mouse with software .. 129.95

MOUSE SYSTEMS

Mouse with pop-up menus. Design your own menus for most programs. Complete software included (requires RS-232 port) ..... ***See Box***

PERSYST

Memory expansion card 64K-384K, Parallel and Serial ports, Clock/Calendar and software w/64K 259.95

QUADRAM QUADBOARD

New! **Expanded Quadboard,** expandable from 64K to 384K, 1 parallel 1 serial and game port I/O bracket and quadmaster software
64K ..... 264.95 384K 569.95

STB

RIO PLUS Multi function board 64K-384K exp. memory. 1 serial 1 parallel and game port (game port cable included) clock calendar and PC Accelerator software.
Rio Plus 64K 254.95

TEAC

Half Height DS/DD Disk Drive 134.95
CDC DS/DD Disk Drive 199.95

TECMAR

CAPTAIN multifunction memory board expandable from 64K to 384K.
64K ..... 259.95 256K 399.95

HARD DISK DRIVES

ALLOY

Cartridge back-up system for PC/XT & compatibles. 16.5 MB per single cart. *Interface card included* ... 1749.00

ALLOY PC STOR

New! **PC-STOR** Hard disk drive subsystem w/cartridge tape backup
20 MB (16 FMT) . **Call** 52 MB (41 FMT) . **Call**
40 MB (32 FMT) . **Call** 85 MB (67 FMT) . **Call**

DATAMAC TRUSTOR

10 mega byte external hard disk drive with cabinet and power supply for IBM-PC. Interface card and controller included 999.95
FIXT Autoboot ROM for Trustor/10 ..... 64.95

IOMEGA BERNOULLI BOX

10 MB bernoulli box 2295.00
20 MB (2-10 MB in cabinet) . 2995.00
10 MB cartridge 69.95
FIXT Autoboot ROM f/above .. 94.95

TALLGRASS

Hard drive sub system with backup.
TG-3020 20 MB w/backup .. 2795.00
DC-600 Data cartridge 34.95

10 MB Internal Hard Drive for PC w/controller card, Auto boot, Low power 949.00

DISPLAY CARDS

AST Monograph Plus parallel/serial and clock calendar, Lotus 1-2-3 graphics compatible 399.95
HERCULES Color Card 179.95
Graphics Card (Monochrome) 339.95
New! **PARADISE** Modular Graphics Card 294.95
64K RAM board expandable to 256K, with clock 209.95
Parallel port for above 79.95
PLANTRONICS Color Plus .. 324.95
STB Graphix Plus II (Color and Monochrome) 349.95
TSENG Ultrapak Monochrome card, 132 column with Lotus and graphics 469.95

MODEMS

HAYES

Smartmodem 300 ..... 199.95
Smartmodem 1200 RS-232 .. 479.95
Smartmodem 1200B Internal with Smartcom II 419.95

VEN-TEL

PC Half Modem-Internal 300/1200 modem fits in short slot of XT or PC portable w/Crosstalk XVI 429.95
1200 Plus-External 300/1200 . 379.95
(Requires RS-232 Card and Cable)
1200 Baud, Internal Auto Dial/Answer 259.95

MONITORS

PRINCETON

HX-12 Hi-res RGB Color 469.95
MAX-12 Monochrome (to use with Monochrome Card) Amber .. 169.95

TAXAN

420-12"-super hi-res RGB color 429.95
122-12"- Amber for PC *(requires monochrome card)* . 144.95
121-12"-green for PC *(requires monochrome card)* . 154.95

PRINTERS

BROTHER

HR-15 13 CPS 399.00
HR-25 23 CPS 649.00
HR-35 36 CPS 899.00
Tractor Feed f/HR-15 or HR-25 124.95
Single Sheet Feeder for HR-15 or HR-25 ..... 219.95

DIABLO

630 API letter quality 1499.95
Tractor Feed 269.00
Parallel Cable for 630 to PC .. 45.00
Single Sheet Feeder for 630 . 479.95

EPSON

RX-100 ... 399.95 RX-80 F/T . 299.95
FX-80 .... 419.95 FX-100 ... 609.95
RX-80 .... 249.95 JX-80 Color 599.95

JUKI

6100 18 CPS Letter Quality .. 429.95

NEC

3550 letter quality 33 CPS . ***See Box***
2050 letter quality, 18 CPS .. 894.95
Tractor Feed 3550/2050 ..... 209.95

OKIDATA

OKI-92 ..... ***Call*** OKI-84 ..... ***Call***
OKI-93 ..... ***Call*** OKI-82 ... 319.95

OLYMPIA

Compact R/O parallel and serial letter quality 369.95

PANASONIC

KXP-1090 80 CPS F/T 269.95
KXP-1091 120 CPS F/T 329.95

HARDWARE SPECIALS

NEC 3550 Letter quality printer — **$1495.00**

HYPERION 256K portable IBM® compatible
2-320K drives and 7" amber monitor. Free Lotus 1-2-3 and an Internal 300 baud modem — **$1895.00**

MOUSE SYSTEM
Mouse with software — **$139.00**

QUADRAM QUADBOARD Model #5256
Memory expansion board w/256K RAM installed, 1 parallel, 1 serial port & Quadmaster Software — **$349.95** LTD QTY

ACCOUNTING

OPEN SYSTEM ACCOUNTING
General Ledger, Acct's Receivable, Acct's Payable, Payroll, Inventory, Sales Order Proc., Team Manager — **$419.95** each
BI-286 D (Required to run programs) **$149.95**

IUS Accounts Receivable, Accounts Payable, General Ledger, Order Entry — **$289.95** each
Payroll **$349.95**

OSPREY ACCOUNTING SOFTWARE
Accounts Receivable, Accounts Payable, General, Ledger, Inventory, Sales Invoicing ..... **$219.95** each

QUME

SPRINT II/55 plus 55 CPS with interface 1599.00
(Specify IBM PC parallel or standard Centronics parallel).

SILVER REED

EXP-550 16 CPS 449.95
EXP-770 31 CPS 869.00
Tractor Feed for EXP-550 ... 124.95

TEXAS INSTRUMENTS

855 with Tractor Feed 799.95

TOSHIBA

P1351 Printer 1329.00
P1340 Printer 779.95

GENESIS SINGLE SHEET FEEDERS

for Juki 6100 ..... 279.95
for NEC 3550 ..... 349.95
for Diablo 630 ..... 349.95
for Silver Reed 550/770 ..... 209.95

FLOPPY DISKS

	SS/DD	DS/DD
IBM 5¼" (10 pk.)		29.95
MAXELL 5¼" (12 pk.)	19.95	29.95
FUJI 5¼" (10 pk.)	18.99	24.95
NASHUA 5¼" (10 pk.)	17.95	22.95

SOFTWARE

ALPHA

Electric Desk 229.95
Data Base Manager II 164.95

ASHTON TATE

Dbase II 289.50
New! Ashton Tate DBASE III 379.95
Ashton Tate Framework 379.95

BEST PROGRAMS

PC Professional Finance II .. 149.95

BPS

BPS-Business Graphics *(requires color card)* 209.95

BILLBRIGHT—ROBERTS

Graphics Partner 89.95
See box for special offer

BUSINESS SOLUTIONS

Jack-2 ..... 289.95

CBS SOFTWARE

Managing for Success
People Management 59.00
Personal Development 59.00
Micro SpeedRead 87.50
Mastering The SAT 99.50

COMPUTER EDI TYPE

MagicBind for Wordstar 174.95
(Req. Diablo, Nec or Qume compatible letter quality printer).

CONCENTRIC DATA SYSTEMS

C.I.P. Concentric Information Processor 249.00

DOW JONES

Connector 39.95
Investment Evaluator 99.95
Market Analyzer (req. clor card) .. 239.95
Market Manager 199.95
Market Microscope 239.95
Spread Sheet Link 169.95

DAYFLO Dayflo (XT/256K) 339.95

FOX & GELLER *for D Base*

Quick Code* 149.95
Dutil* 44.50
D Graph* 149.95
**For D Base II or III. Please specify*

OZ (req. 256K & color card) 219.95
R Graph (for R Base 4000) 149.00

FUNK SOFTWARE

Sideways 44.95

HARVARD SOFTWARE

Harvard project manager 259.95

HARVARD ASSOC

PC Logo (req. 128K/color card) 99.95

HAYES

"PLEASE" Data Base 229.95

HERITAGE SOFTWARE

Smartkey II 49.95

HUMAN EDGE

The Management Edge (128K) 165.00
The Sales Edge (128K) 165.00

shopping center for any IBM® PC products.

SOFTWARE SPECIALS

CROSSTALK XVI Communication software	$98.50
PRENTICE HALL Execuvision *(Req. color card)*	$259.95
GRAPHICS PARTNER with purchase of dBase II, dBase III or Framework	$29.95
IN SEARCH by Menlo Park	$279.95
VISICORP VISIWORD PLUS	$104.95

SYSTEMS

MBSI (Real World) ACCOUNTING
General Ledger, Acct's Payable, Acct's Receivable, Inventory Control, Order Entry/Billing, Payroll ..... $399.95 each
Sales Analysis $249.95

STATE OF THE ART ACCOUNTING
General Ledger, Accounts Receivable, Accounts Payable, Inventory, Payroll ..... $409.95 each
Budget and Financial Reporting, Sales Invoicing *(Requires Accounts Receivable)* $379.95 each
Professional Time and Billing $594.95

KNOWARE
Knoware *(requires color card)* 64.50

KRELL SAT 199.95

LIFE TREE
Volkswriter Deluxe 169.95

LIVING VIDEOTEXT
Think Tank *(requires 256K)* .. 134.95

MECA
Andrew Tobias Managing Your Money (128K) 134.95

MICRO DATA BASE SYSTEMS
Knowledge Man 1.6 ..... 249.95

MICRO PRO
INFOSTAR PLUS Version 1.6 .. 274.95
Includes Star Burst
Wordstar Pro Pack 269.95
Wordstar 3.3 ..... 189.95

MICRORIM
R Base 4000 *(requires 256K)* 279.95
Extended Reportwriter 96.50
Clout 119.95

MICROSOFT
Chart 159.95
New! Flight Simulator 34.95
Fortran Compiler MS/DOS ... 229.95
Pascal Compiler 194.95
Macro Assembler 69.95
Multiplan 129.95
Word w/Mouse 279.95

MICROSTUF
Crosstalk XVI ..... *See Box*

MONOGRAM
Dollars & ene 104.95

MULTIMATE
Multimate Version 3.22 ..... 269.95

PBL CORP
Letterform 1000 DOS 2.0 ..... 64.00
Personal Investor 124.00

PETER NORTON
Norton Utilities 49.95

POWER BASE SYSTEMS
Power Base 259.95

PROFESSIONAL SOFTWARE
Word Plus PC with BOSS 279.00

ROSESOFT
Prokey 3.0 ..... 84.00

SIMON & SCHUSTER
Typing Tutor III 32.95

SOFTSTYLE
SET-FX + (f/Epson FX printers) 49.95

SOFTWARE INTERNATIONAL
Open Access *(req. 256K color card)* . 299.95

SOFTREND
Aura (DOS 2.0/256K) 329.95

SOFTWARE PUBLISHING
PFS File ... 89.95 PFS Graph . 89.95
PFS Report 79.95 PFS Write . 89.95

SSI
Word Perfect with Speller 269.95

STATE-OF-THE-ART
The Bookkeeping System 359.95

SOFTWARE ARTS
TK Solver 259.95

SUMMA SOFTWARE
Traders Accountant 299.95
Winning on Wall Street
Traders Data Manager 139.95
Traders Forcaster 169.95

VISICORP VISI^ON
(Requires XT with 512K)
Calc ..... 229.95 Mouse ... 159.95
Graph .... 149.95 Word 219.95
Application Manager *(required)* 57.95

VISICORP
VisiCalc 4 w/Stretch Calc 149.95
VisiWord Plus 104.95
VisiFile Version 3.0 ..... 99.95

VM COMPUTING
Relay Communication software 99.50

WARNER SOFTWARE
Desk Organizer 169.95

WESTERN UNION EASY LINK
Instant Mail Manager 69.95

- *No surcharge for credit cards.*
- *Prompt and efficient service.*
- *Extensive inventory of PC products.*
- *Knowledgable and experienced sales staff.*

We stock an extensive inventory on IBM PC/XT,® Apple,® AT&T,® Kaypro,® Compaq,® Hyperion® and Olivetti® .

Remember Our Name — It's all the Memory You Need.

47st. Computer
Computers and Business Equipment®
A Division of 47st. Photo Inc.

Now at 3 convenient locations

67 W. 47th St. • 115 W. 45th St.
39 Ann Street *Near City Hall and the World Trade Center*

Mail Order Address: 36 East 19th Street
New York, N.Y. 10003

212-260-4410

TOLL-FREE OUT-OF-STATE **800-221-7774**

CIRCLE 197 ON READER SERVICE CARD

STORE HOURS:
Sunday 10-4, Monday-Thursday 9-6, Friday 9-2

We accept MC, Visa, American Express & personal checks (no delays if approved). Minimum shipping and handling $4.95. Software found to be defective will be replaced immediately. Defective hardware will be repaired or replaced at our discretion within the warranty period of manufacturer. Defective items must be sent to 36 East 19th Street, New York, N.Y. 10003, Att: Service Dept. Prices herein are for mail & phone orders only. Store prices may differ. Some items are subject to availability. Due to manufacturers price fluctuations, the prices may change beyond our control. This ad supersedes all previous PC ads.

Keep in touch with the latest items on the market and our up-to-date sale prices by checking our weekly ads in the National editions of the N.Y. Times and Wall Street Journal.

IBM® is a registered trademark of International Business Machines Inc
PC Magazine Nov. 13-Nov 27. PC World Dec 1. Submitted Sept 13, 1984

WE TURN YOUR PC INTO A GRAPHICS TERMINAL WITH VTERM/4010

The original VT100 terminal emulator for the IBM PC has something new under the hood: Tektronix 4010/4014 emulation. Now you can use one powerful, well-built software package for mainframe graphics, terminal emulation and file transfer.

VTERM/4010 gives you all of the features of VTERM II, plus Tektronix graphics. It can run mainframe graphics applications from SAS, ISSCO, Tektronix (PLOT 10), Precision Visuals, and many other similar packages. And VTERM/4010 will save pictures on disk, or draw them on Hewlett-Packard and IBM plotters.

But that's not all. As thousands of users know, the VTERM communications line comes standard with these exceptional features:

- Complete VT100, VT101 and VT102 emulation.
- Full throughput to 9600 baud.
- A highly reliable error-free file transfer with CRC checking, including complete host software for several host operating systems.
- XMODEM file transfer also supported.
- An ASCII file transfer system with a wide variety of options that allow exchanges with most host systems using only standard host utilities.
- Optional 132 column display using a special display adapter available from Coefficient.
- Autodialing, on line help, and a unique softkey command system that lets you automate many communications functions.
- Easy-to-use setup screens always accessible with a single keystroke.
- Multiple setup files.
- A "hot-key," that lets you switch instantly back and forth between DOS and VTERM without ever losing your terminal screen or communications link.

Get the picture? VTERM II gives you DEC terminal emulation, file transfer and lots more. VTERM/4010 gives you all that plus Tektronix graphics.

Call Coefficient or your local dealer today.

Coefficient Systems Corporation (212) 777-6707 611 Broadway, New York, N.Y. 10012

CIRCLE 128 ON READER SERVICE CARD

Integration At the End of The Bridge

GOLDENGATE, Cullinet's first software package for micros, puts it all together for you with a dazzling display of functions. It's destined to become a strong competitor.

When a well-respected mainframe software house decides to test the micro waters, you would expect it to do so one toe at a time. But Cullinet, the venerable Massachusetts-based software house known for its mainframe database management systems, is entering the micro waters boldly. It has plunged into the hotly contested integrated software market with its new *GOLDENGATE* system.

GOLDENGATE, Cullinet's first micro package, gathers word processing, database management, spreadsheet manipulation, graphics, file management, and communications (sync and async) into a compact, beautifully documented package for $795. *GOLDENGATE* bases its concept of integration on a few ground rules: all screens and menus are identical; special-purpose keys and functions do the same thing in the various programs; and you can readily transfer files among the programs with minimum intervention.

GOLDENGATE is also designed to work with the *Information Database*, a program that links it to mainframe data-

Illustration: Akio Matsuyoshi

bases and downloads information for manipulation on the PC. (See previous article, "A Bridge Between Mainframes and Micros.")

PC Magazine had the opportunity to look at *GOLDENGATE* before its release to the public. The package suffered from a few prerelease jitters, but clearly, Cullinet could very well become a major competitor in the integrated software market with this new standalone integrated system for PCs.

The System's Heart

GOLDENGATE's Information Management Tool (IMT) is at the heart of the system. Basically, IMT is a DOS shell that shows drives, directories, subdirectories, and files graphically in the form of a tree. It lists them when you ask it to "open" an element of the tree.

GOLDENGATE substitutes office terminology for computer jargon. It calls a drive, for example, a catalog; a subdirectory, a folder; and a file, an object.

The package's programs (called tools) supply their own extensions to files, translated into plain English in the IMT displays. A spreadsheet file named COSTS shows up in the IMT display as a COSTS worksheet. An edit file of the same name appears as a COSTS document. Similarly, a file from the database manager shows up as a COSTS data table. You can also add a brief explanation of the file's contents, such as "first-quarter" COSTS. *GOLDENGATE* will show it in the IMT display along with the expanded file name.

GOLDENGATE
Cullinet Software Inc.
400 Blue Hill Drive
Westwood, MA 02090
(617) 329-7700
List Price: $795 for standalone version
Requires: 5-megabyte hard disk drive or XT, 320K RAM, IBM Color/ Graphics Adaptor, DOS 2.0.

CIRCLE 734 ON READER SERVICE CARD

The menu selection techniques seem to use the best elements of Microsoft's Multiplan and Lotus's 1-2-3

To explore directories, subdirectories, and paths, you either use cursor keys that highlight elements or type in DOS-like commands.

One of *GOLDENGATE*'s more interesting features is its file-first system for entering programs. Also, you can use all *GOLDENGATE* tools in the usual way. Selecting the Edit tool, for example, puts you in the word processor. You can then tap a function key to see a menu of document type files (objects) and load the object (or objects) of your choice. Or you can start in the IMT and put the cursor over a file (object). If you tap the "Open" function key, the system will read the file type, put you in the appropriate tool, and load the selected file. Opening a document file, for example, puts you in the Edit tool, with that file active. Opening a worksheet file puts you in the Spreadsheet tool, with that file active.

Human Factor

GOLDENGATE's project directors admit that they reviewed available software for microcomputers carefully, looking for the best ideas other firms have used in developing new ways for incorporating the human factor into the interfaces. They seem to have adopted the best. As I mentioned, all menus and work screens are identical from tool to tool. The menu selection technique seems to use the best elements of MicroSoft's *Multiplan* and Lotus's *1-2-3*.

Each tool, for example, has a four-line message element at the bottom. The first line is reserved for status and error messages, the next two for the command menu and "microhelp" (a brief explanation of a selected command), and the bottom line for keyboard input, In addition, you can use cursor keys to highlight elements in the command menu you want to select, or you can enter the first letter or two of the command to invoke the action. *Multiplan* and *1-2-3* users will feel right at home.

If you're experienced, you can type in a whole string of commands, using their abbreviations. You can even turn on the Teach function to record the string of commands as a macro procedure. Later you can call the procedure (or Open it from the IMT menu) to invoke the complex command.

Cullinet's use of color in *GOLDENGATE* is the best I've seen. You use one of the package's tools, called Prepare, to set up the system. A color page in Prepare enables you to choose colors for dozens of screen attributes in the other tools. The Spreadsheet tool, for example, shows labels in white, numeric values in green, negative numeric values in red, and command menus and system comments in two tones of yellow. The cell grid is in light blue.

GOLDENGATE's Tools

The package's tools, or its programs, share some of the best elements Cullinet has incorporated into the overall system. First, the Edit tool comprises a full-blown word processing system that has all the features you would expect from a top-of-the-line word processor. You can use it to handle tables of contents, chapter headings, footnotes, and indexes automatically. The system is menu driven or command driven, at your option.

In addition, the Edit tool can read sections of spreadsheet files. Plus it can graph

pictures and automatically insert their images into the text. And, as you would expect, you can use *GOLDENGATE*'s Edit tool with its Database tool to generate documents that have database information imbedded in them.

Cullinet did not compromise quality in an effort to integrate the system when it gave individual tools their capabilities. Like the Edit tool, the Spreadsheet tool is a complete system in itself. It uses the best techniques of *1-2-3* and *Multiplan*, including highlighting to define cell ranges and prompting for the most probable next action. It also performs a complete array of arithmetic, string, and logical functions, including vertical and horizontal table lookup.

The Spreadsheet tool can read DIF files from the outside world, ASCII text files from the Edit tool, or rows and columns of data from the Database tool. You can also use it to read rows and columns of data from an outside database by using the Emulator (communications) tool. The spreadsheet uses alphanumeric cell identifiers (A1, A2, and so forth); it has 256 columns and 2,048 rows. (Since an active spreadsheet must fit in memory, its size is memory dependent.)

The Spreadsheet tool has much in common with the Database tool, even though they are entirely separate devices. (This particular characteristic of *GOLDENGATE* differs from the database manipulation used by Lotus's *1-2-3*.) The Database tool uses both memory and mass storage, and so a database file is media bound (up to 64K records), unlike the spreadsheet, which is memory bound.

Database fields (columns) can encompass as many as 72 positions before they become truncated. You can simultaneously open up to six data tables, and you can arrange fields from those tables in up to six "views" of the tables.

Suppose you maintain two departmental data tables, budget and actual expense. Once a month you want to compare the budget table with the actual expenses (updated weekly) table. First you would open both data tables in the database manager and extract the information necessary from each to form a "view" in the database. You could actualize the budget here or move the information in the view to the spreadsheet to analyze in detail.

You can save rows or columns of information from either the spreadsheet or the database, as ranges for the Graph tool. Finally, you can hold this information for the Edit tool, to include in a presentation. You can prepare the presentation using the Edit tool or send the output from the Edit tool to the Emulator, to be transmitted electronically.

Meanwhile, you can use the spreadsheet calculations to update any of the database tables.

In Cullinet's view, the database and spreadsheet functions are so closely aligned that it has incorporated a toggle that lets you bounce back and forth between the two tools. Additionally, most arithmetic and logical functions of *GOLDENGATE*'s spreadsheet are available in the database for you to select and calculate on the fly.

Emulate is *GOLDENGATE*'s communications tool. You can use it as a smart asynchronous terminal with upload and download capability and automatic control through a Hayes compatible modem. Or the Emulator tool can emulate an IBM 3270 terminal if you install an optional communications board. It can handle synchronous direct communication with a mainframe through *Information Database*, Cullinet's micro-mainframe link.

> The Edit, Spreadsheet, Database, and Emulator tools could compete with the best.

Cullinet gives you an interactive tutorial on two diskettes as well as more than 600 pages of documentation on how to use *GOLDENGATE*. In my opinion both the tutorial and the documentation (stored in two 8½-by-11, three-ring binders) are much better than what usually accompanies software for microcomputers.

Putting It All Together

The most significant test of an integrated software package is how it puts it all together, integrating the functions it handles for you. As far as integration of functions is concerned, Cullinet has done its job well. It has carefully and thoughtfully put together a system that uses identical menus, keystrokes, and prompting schemes in each of its tools.

Also much to its credit is Cullinet's refusal to compromise with the features of *GOLDENGATE*'s individual tools. The Edit, Spreadsheet, Database, and Emulator tools could compete on their own, outside of an integrated package, with the best word processors, spreadsheets, database managers, and communications packages.

One compromise I did notice, though, was in speed, despite the fact that its designers wrote *GOLDENGATE* in the C language to optimize speed. Loading a long file into the Edit tool, for example, takes about twice as long as loading the same file into a standalone word processor. Similarly, the time the Spreadsheet tool takes to update the cells in a large spreadsheet is about double the time a standalone spreadsheet takes to do the same task. Apparently the added time spent handling files is part of the price you pay for the advantages an integrated package offers.

If you are in the market for a well-implemented integrated package for your PC, be sure to put *GOLDENGATE* on your personal review list. My guess is that it will be one of the strongest competitors you will consider. ■

General DataComm beats Hayes for accuracy.

And we can prove it.

We put our 212 modem to the critical test. We stacked it up against Hayes, one of the "smart" modems.

The Performance

Hundreds of phone calls were carefully monitored, analyzed, and verified by telecommunications engineers. After exhaustive testing, the results were conclusive: when line quality was average, our modem was one and a half times more accurate than Hayes. When line quality was bad, however, our modem was up to ten times more accurate. And when line quality was really bad, their error rate shot up to as much as 100 times ours! The errors ranged from misspelled words to incorrect numbers. The implications for modern business are understandably serious.

The Reliability

Then we went inside and did a component count. The final score: Hayes 252, us 155. This can be viewed two ways: Either Hayes has a 60% better chance of developing part failure, or our modem has a 60% better chance of delivering higher reliability.

Eliminating operator risk is as important to us as eliminating errors. With our modem there's virtually no risk of electrical damage because there are no internal switches to deal with. General DataComm modems automatically select all call parameters.

The Company

The General DataComm intelligent modem is the newest product of a company that has been designing data communication systems for 15 years. A company whose customer list is a "Who's Who" of international business. Most of the Bell operating companies, and other telephone companies in the U.S. and Canada. Major banks. Brokerage firms. And many of the Fortune "500."

We build multiplexers, modems, local area and digital network products, and the most complete networking systems on the market. Now we're applying the technology that won the respect of big business and Bell to the personal computer market. With a line of 300 and 1200 bps modems and our own communications software.

The General DataComm modem. We put it to the critical test. Now it's ready for the ultimate test. Yours. To find the dealer nearest you, contact the Personal Computer Products Dept., (203) 574-1118. General DataComm Industries, Inc., Middlebury, CT 06762-1299.

General DataComm

The best connections in the business.

CIRCLE 188 ON READER SERVICE CARD

TOGETHER, STOPPING YOU.

THERE'S NO

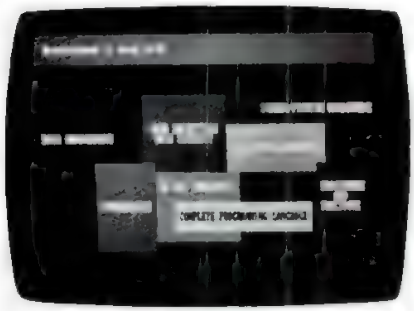
KnowledgeMan™ and You. The possibilities are endless.

To succeed in business, you need a partner that's fast, flexible, intelligent and easy to work with. A partner that can help turn your big ideas into well-conceived reality. One that gives you the support you need to make critical decisions confidently.

No partner can give you more of what you need than KnowledgeMan, the knowledge management software from MDBS.

A powerful partner.

KnowledgeMan helps you manage more knowledge, in more ways, than ordinary software. It can help you make better decisions on just about everything from production scheduling to financial planning to market



forecasting. KnowledgeMan and its optional components offer data management, spreadsheet analysis, statistical analysis, text processing, forms management, business graphics, programming and more.

The key to KnowledgeMan's versatility is its exclusive synergistic integration, allowing you to accomplish your computing needs within one program. Unlike other software, there's no need to exit one function before entering another. The result: different kinds of processing can be intermingled. Quickly and easily.

A partner that speaks your language.

For all of its power and sophistication, KnowledgeMan is remarkably simple to understand. Even a beginner can start putting KnowledgeMan to work in minutes. With a single query, you can obtain related data from unlimited multiple tables. You can even teach KnowledgeMan to understand your own jargon.

A partner that helps you along.

The on-line HELP facility allows you to draw on 6800 lines of helpful information organized into 380 screens. If you have a problem or question, KnowledgeMan allows you to access the pertinent HELP screen immediately. Each screen is carefully designed to provide a quick reference guide to KnowledgeMan commands.

A partner that gives you room to grow.

Ordinary software packages can be frustratingly easy to outgrow. Not KnowledgeMan. Each KnowledgeMan component has more power than you'll probably ever need—far more than conventional integrated programs. With KnowledgeMan, you don't sacrifice capability, capacity or convenience. So with KnowledgeMan, you spend your time solving problems—not trying to overcome software limitations.

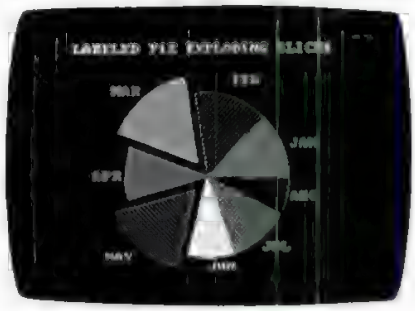
A partner that protects your interests.

KnowledgeMan offers sophisticated security features. Unauthorized access to data is next to impossible, thanks to password checking, thousands of access code combinations and data encryption.

So your secrets are safe with KnowledgeMan.

A partner you can build on.

To add yet another dimension to KnowledgeMan's capabilities, you can get fully-integrated options like K-Graph, an extensive business graphics facility that



lets you plot information in a variety of colorful graphs, charts and diagrams. For text processing, the K-Text option lets you incorporate data into written documents quickly and easily. Or, create highly-polished, full-color customized forms with K-Paint, our forms painting option. To short-cut the keyboard, put the K-Mouse option to work.

A partner you should get to know better.

To see KnowledgeMan in action, visit your dealer. Or contact Micro Data Base Systems, Inc., P.O. Box 248, Lafayette, IN 47902, (317) 463-2581, Telex: 209147 ISE UR.

It may be the beginning of a long, successful partnership.

Current version is 1.07 as of 9/10/84. KnowledgeMan, K-Graph, K-Paint, K-Text, and K-Mouse are trademarks of Micro Data Base Systems, Inc. MDBS is a registered trademark of Micro Data Base Systems, Inc.

KNOWLEDGE man™

The Knowledge Management Software from MDBS

Operating Systems: PCDOS, MSDOS, CP/M-86. Minimum RAM required: 192K. K-Graph: PCDOS only.

CIRCLE 525 ON READER SERVICE CARD

Considering Tape For Backup Storage?

. . .Tut, Tut.

There was a time when tape was the way to store backup data from your hard disk. It was fine for archives, but not when you wanted your data live and on-line. Today's business pharaoh can have his data on-line and backups, too—with 5 or 10 megabyte **removable cartridge** hard disk systems from **Micro-Design**.

Single-function tape backup units can't come close to matching the versatility and cost-effectiveness of hard disk cartridges; you get backup capabilities PLUS the benefit of having another full 5 or 10 megabytes of on-line data access.

Use hard disk cartridges the same way you use a floppy disk system. Just switch them out as needed—one cartridge for wordprocessing, another for accounting, and another for backup storage. Add additional cartridges whenever you like.

Fast. Cartridges run as fast, or faster, than fixed hard disk drives. A 5 megabyte backup takes only a few minutes, using Micro-Design's backup utility software. Switching out cartridges takes just a few seconds.

Convenient and Secure. It's easy to lock-up sensitive files—just remove the cartridge and put it somewhere safe. If you share a computer with others, everyone can have their own cartridge. Or, have a home cartridge and a business cartridge for use with your portable computer.

IBM® International Business Machines.

Unlimited Expansion. No more erasing old data to increase space on your hard disk. Fact is, there's no limit to the amount of off-line storage you can add.

Our **DATA Series** 5 and 10 megabyte cartridge hard disks are external drives available in removable only, or paired with 10, 20, or 33 megabyte fixed drives. Our **SQ Series** features 5 megabyte cartridge drives, in matching external cases or ready for internal installation. All are 100% compatible with the IBM-PC, XT, and work-alikes, with no software modifications needed. You can even boot from the hard disk.

Don't let single-function hard disk and tape units send your asp up the Nile. Ask your local computer dealer about Micro-Design's versatile hard disk cartridge units. Or, call us for details on our full product line and ordering information. Dealer inquiries invited.

We've got a complete line of mass storage devices, including floppy drives. Prices start as low as **$1549** for a 20 megabyte fixed hard disk drive. Call for our **FREE** catalog today!

One year warranty. Network compatible. Backup utility software included with 2 drive systems.

MICRO-DESIGN · MASS STORAGE DEVICES

Micro-Design

Making The Most of Your Micro.

Call Toll FREE **1-800-531-5002.**
In Texas, call 512-441-7890.
6301 B Manchaca Rd., Austin, TX 78745

CIRCLE 165 ON READER SERVICE CARD

The Shortcut to Business Productivity

Touch and Go

Tired of typing in long computer commands? Let the Speed Key System take control. The Speed Key System consists of the KT 2010 touch tablet, Speed Key Software, and nine pre-configured overlays for Lotus 1-2-3™, WordStar®, Visicalc®, pfs:write®, SuperCalc®, MultiPlan™, dBase II™, DOS® and Basic®. By placing an overlay on your touch tablet, Speed Key can reduce as many as 80 keystrokes to a single push-button command. Now you can delete and insert paragraphs, or leap across spreadsheets in a single stroke.

How to Make A Good Program Great

With Speed Key, you can reprogram keys to fit your individual needs or create your own custom overlays for almost any of the hundreds of IBM PC-DOS programs.

But There's More...

In cursor mode, Speed Key moves the cursor on the screen as you move your finger along the surface of the touch tablet. And you don't need any more desktop space than the tablet itself, about half the size of an 8½ x 11 notepad.

Visit your Local Computer Dealer

Take a look at the Speed Key System which includes • Speed Key Software • KT 2010 Touch Tablet • Speed Key Owners Manual • 9 Pre-Configured Tablet Overlays • Blank Overlays. Or call us toll free, 800-KOA-BEAR.

Koala Technologies™
3100 Patrick Henry Drive
Santa Clara, CA 95052-8100

CIRCLE 172 ON READER SERVICE CARD

1-2-3™ and Lotus™ are trademarks of Lotus Development Corporation. pfs® write is a registered trademark of Software Publishing Corporation. SuperCalc® is a registered trademark of Sorcim Corporation. Microsoft® is a registered trademark of the Microsoft Logo. MS and MultiPlan are trademarks of Microsoft Corporation. Visicalc® is a registered trademark of Personal Software Inc. WordStar® is a registered trademark of MicroPro International Corporation. dBase II® is a trademark of ASHTON-TATE. DOS versions for the IBM personal computer are registered trademarks of International Business Machines Corporation and Microsoft Corporation. IBM Basic and IBM PC/XT are registered trademarks of International Business Machines Corporation.

You'll find the excitement under the covers.

The most exciting computer news since the micro: Framework.™

It's idea processing, word processing, electronic spreadsheets, database management and automatic graphics. With a unique outlining feature that allows you to put it all together more easily than ever.

Whether you're a novice or a techie, Ashton-Tate has a Framework book to explain the program, its language and application in the detail you require.

Framework: An Introduction, by Bill Harrison
The first in a series of Framework books designed to show users how to take advantage of this new program's flexibility. Includes explanations of all of Framework's major features. A must for first-time users. Suggested retail price $15.95.

Framework: On-The-Job Applications, by Expert Systems, Inc.
A collection of timesaving applications for those interested in putting Framework to use immediately. An ideal book for business professionals who don't have time to develop their own applications. Suggested retail price $19.95; with disk, $29.95. Available Fall '84.

Framework: A Programmer's Reference, by Forefront Corporation
A reference source for programmers developing applications with Framework. Includes a programming tutorial and an extensive functions directory for the FRED™ programming language. Suggested retail price $24.95.

Framework: An Introduction to Programming, by Forefront Corporation
A first-time-user's introduction to Framework programming. With an extensive tutorial on the functions and capabilities of the software. Suggested retail price $19.95. Available Fall '84.

Framework: A Developer's Handbook, by Forefront Corporation
A complete handbook for the Framework program developer. Organized for quick and easy access. An invaluable addition to any developer's library. Suggested retail price $24.95. Available Fall '84.

So if you're thinking of buying the program, buy the book, too. They're made for each other. And both are made for you.

And Ashton-Tate has a rapidly-growing library of microcomputer-related books for computer users of every level. To get a copy of our latest catalog, contact your local Ashton-Tate dealer. For the name and location of your nearest dealer, contact Ashton-Tate, 10150 West Jefferson Boulevard, Culver City, CA 90230. (213) 204-5570.

ASHTON·TATE™

© Ashton-Tate 1984. All rights reserved.
Framework and FRED are trademarks of Ashton-Tate.

CIRCLE 221 ON READER SERVICE CARD

IBM's UNIX FORMULA FOR YOUR PC

PC/IX multiplies your PC-XT's responsiveness and factors in the power of a larger system. The cost? Ease of use and disk performance.

In the realm of multi-user microcomputer systems, UNIX has rapidly emerged as the industry's de facto standard operating system. IBM made a commitment to UNIX when it supplied an implementation of XENIX, as well as PC-DOS 3.0, for its multi-user PC AT. In the world of single-user PCs dominated by MS-DOS, however, UNIX is just beginning to make an impact.

PC/IX is the first implementation of UNIX for the IBM PC available directly from IBM. With its introduction, IBM has firmly endorsed UNIX as an alternative operating system for the PC.

Advocates of UNIX have hailed it as a "real" operating system with the features needed to support powerful applications on the next generation of microcomputers. Critics counter that UNIX is difficult to use, as well as much too large and cumbersome to be effective on a personal computer. Clouding the issue are the newer releases of MS-DOS, which include some of the most notable features of UNIX, such as its hierarchical file system, input/

output redirection, and pipes.

With IBM's PC/IX you can now judge the merits of UNIX for yourself. *PC* took a first look at PC/IX when it was announced early in 1984 (see "IBM Goes UNIX," *PC*, Volume 3 Number 11). The present in-depth review gives you more information.

All There—and Familiar

PC/IX is a real, live UNIX implementation for the IBM PC-XT. Experienced UNIX users will find in PC/IX all the familiar utilities and tools included in the minicomputer and the supermicrocomputer UNIX versions. With only a handful of exceptions, it's all there—all 5 megabytes of it.

One of the key features of the PC/IX operating environment is its multitasking ability. The system can execute many different programs concurrently. It can, for example, sort a file, prepare a report, and print a series of files at the same time you are editing a document.

PC/IX's hierarchical file system, also one of its key features, enables it to group files into directories and subdirectories that reflect their natural organization. As a result, you can more easily locate and manage stored data. In addition, PC/IX treats files and devices identically so that programs can perform input and output on disk files, terminals, printers, and so forth, without first being modified.

Another key feature of the PC/IX environment is the UNIX shell, PC/IX's powerful command interpreter. The shell supports such convenient features as input/output redirection, pipes, and the ability to manipulate groups of files with a single command. You can also use the shell as a programming language; it allows even unsophisticated users to execute a predefined sequence of commands.

PC/IX includes more than 200 UNIX utility programs for sorting data, processing text, and searching files. The utilities form a powerful set of tools that you can combine to accomplish many tasks without having to write new programs.

Although it supports only a single user at a time on the PC-XT, PC/IX retains the multi-user features of UNIX, such as security and accounting. Several users can share a PC-XT effectively by using these features.

PC/IX also offers a rich assortment of tools that support specialized tasks such as processing text and developing software.

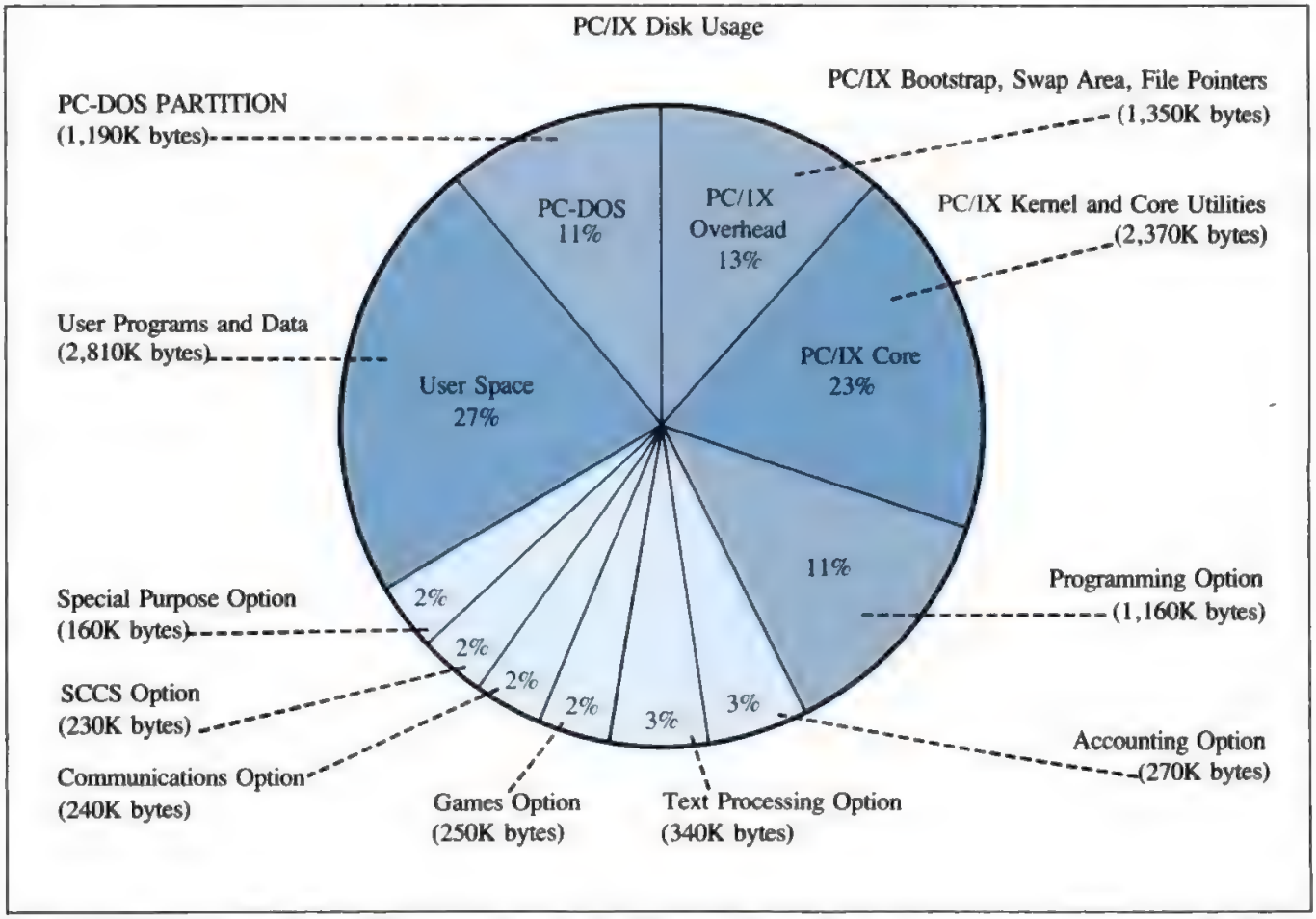


Figure 1: *PC/IX uses about two-thirds of the space on the PC-XT's hard disk, leaving only about one-third for user programs and data.*

Installation and Operation

IBM distributes PC/IX on 19 diskettes, packaged in an attractive binder. Four other binders contain the PC/IX documentation. The PC/IX user's manual (about 1,000 pages) describes the system command by command, in alphabetical order. The text processing guide, the programmer's guide, and the system manager's guide offer a more topical approach to the PC/IX system and its capabilities.

The 19 diskettes are coded by color and grouped by function into an operating system core and optional facilities. The core of PC/IX, in eight disks, includes its kernel and the minimum set of utilities required to operate the system. The programming function, in four disks, includes the C compiler, the assembler, the debugger, and other tools for developing software. The source code control system, in one disk, is PC/IX's utilities that maintain a library of source code to support large programming projects. The communications function, in one disk, includes utilities that give asynchronous communications access to other computers. The text processing function, in one disk, includes utilities that prepare text, tables, mathematical equations, and so forth, for printing. One special-purpose disk includes miscellaneous utilities, including support for text formatting on phototypesetters and laser printers. The accounting function, on one disk, includes utilities that collect data on system usage and print a variety of accounting reports. In addition, a games disk has word and mathematics games such as Hangman, Fish, and Moo. Finally, the maintenance disk includes standalone programs for system maintenance, diagnosis, and installation.

Before you can use PC/IX, you must install it on the PC-XT's hard disk. Installation is a fairly straightforward but time-consuming process. We spent about 45 minutes (with a few mistakes along the way) installing the core diskettes before we could get a UNIX prompt to appear on the screen. We spent nearly another hour loading the remaining diskettes and completing the installation.

Comparison of PC-DOS and PC/IX

	PC-DOS	PC/IX
Total System Software	about 500K bytes	about 4.5 megabytes
Commands and Utilities	about 45	over 200
Minimum Main Memory	64K bytes	256K bytes
Recommended Main Memory	128K bytes	512K bytes
Minimum Mass Storage	320K bytes floppy disk	10 megabytes hard disk + 320K bytes floppy disk

Figure 2: *The relative complexity of PC/IX compared with PC-DOS is reflected in the amount of software supplied, the number of commands and utilities each supports, and the typical system configuration each requires.*

The installation process requires that you divide the hard disk into one or more partitions in which PC/IX and other operating systems may reside. This feature is very handy, since even the most enthusiastic UNIX user will probably want to be able to store PC-DOS applications or data files on the hard disk to use occasionally. However, PC/IX is so large that a majority of the disk must be devoted to its use. We allocated just 35 tracks (about 11 percent of the disk) to a PC-DOS partition, and we used the rest for PC/IX. If you want to use the hard disk for serious PC-DOS *and* UNIX work, you'll need to invest in an extender chassis and a second hard disk.

Figure 1 summarizes how PC/IX uses the space on the PC-XT's hard disk. With all the optional parts of PC/IX installed and the small PC-DOS partition reserved, we had about 2.7 megabytes (or 27 percent of the disk) left for user programs and data files.

PC/IX and UNIX

PC/IX is based on UNIX System III from AT&T. Interactive Systems Corporation of Santa Monica, California, adapted the operating system to the PC-XT for IBM. Experienced users will feel right at home with PC/IX, since the system includes the familiar Bourne shell as its user interface. It also includes all the standard utilities for file processing, text processing, program development, and communications.

Interactive has also added several programs and features that improve the standard AT&T version. They simplified user administration with a menu-driven `adduser` utility for adding users and establishing system security. A more powerful program that can handle multiple printers, different paper sizes, and priority printing replaces the System III spooler. Interactive has supplied detailed instructions with the system configuration files on how to reconfigure the system. It has also included several of the popular Berkeley utilities.

Another group of utilities unique to PC/IX gives you a useful PC-DOS interface. These programs support file exchange with PC-DOS floppies or a PC-DOS partition on the hard disk. Using them with Lotus's *1-2-3*, you could, for example, print a large spreadsheet into a PC-DOS file and then read this print file into a PC/IX file for use by the UNIX utilities for

processing both text and tables.

PC/IX lacks only a few of the "standard" parts of a commercial UNIX system, such as the spooler, the `tar` utility for file backup, and the remote job entry system. You can modify applications that depend on these features so that they can use their PC/IX counterparts. A more serious omission is the `vi` full-screen text editor. Developed at the University of California at Berkeley, `vi` is a passionate favorite of UNIX programmers. Its absence may dampen the acceptance of PC/IX by veteran UNIX users.

Interactive substituted the INed text editor for `vi`. INed incorporates limited word processing features; it includes a number of advanced facilities, such as multiple editing windows and a "history" mechanism for returning to earlier versions of an edited file. Programmers will also like its features that support software development, such as the ability to begin compiling a program automatically when exiting the editor. However, we found INed to be an awkward editor to use in practice. It does not support word-by-word cursor motion, and its command syntax is inconsistent. INed handles text formatting and justification through step-by-step procedures that invoke separate PC/IX programs.

INed is very different in style from modern word processing programs with all of their familiar amenities. If you expect to use INed for word processing, you will most likely be disappointed with its features and ease of use.

Despite Interactive's additions and changes, PC/IX retains the essential character of UNIX—a decidedly mixed blessing. PC/IX gives the experienced UNIX user all the capability normally associated with UNIX. The typical PC-DOS user, however, will probably be overwhelmed by PC/IX's complexity. The PC/IX documentation (like the UNIX documentation from which it is derived) still lacks a conceptual, top-down overview of the system. As a result, installing, using, and maintaining a PC/IX system requires a

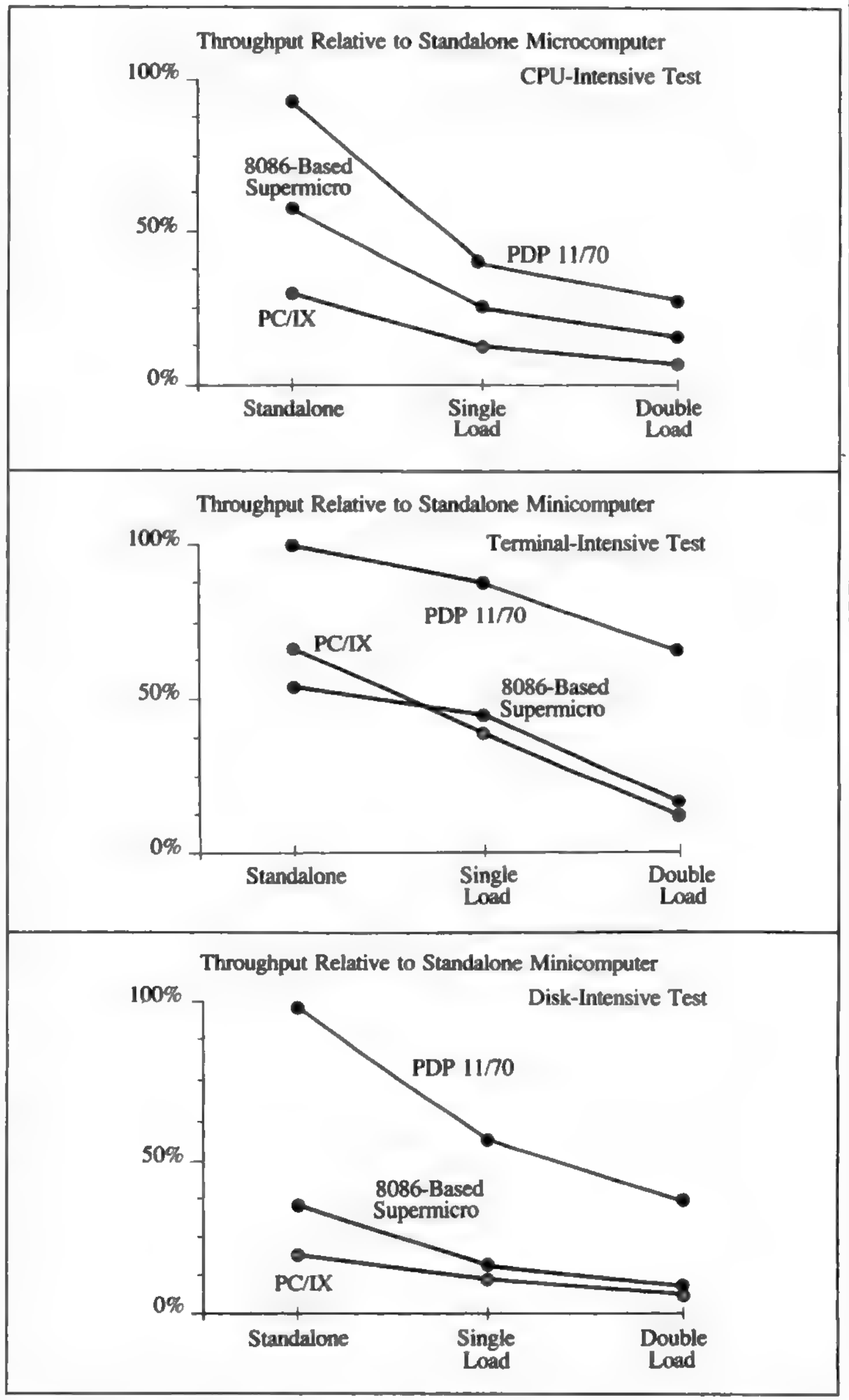


Figure 3: *Comparative UNIX performance is shown by these three graphs, which depict the relative throughput of a UNIX-based minicomputer system (PDP 11/70) and the PC-XT running PC/IX. An 8086-based supermicrocomputer system capable of supporting up to five users under XENIX is also included for comparison.*

SIMPLICITY

Integrated software for decision support and data processing.

IT uncomplicates computing. Ease into IT.

The IT series: integrated software that starts with KeepIT, for data base management, and interfaces to other PC-based software and the IT series programs.

The IT series advances the state of the art–to turn your desktop computer into a complete information center. From AskIT, an intelligent interface to KeepIT. To SwapIT, for memory partitioning and instant windowing.

Simplify things and try IT. You'll like IT.

KeepIT	StatIT	EditIT
CalcIT	LinkIT	SortIT
ShowIT	PassIT	AskIT
WritIT	MailIT	SwapIT

For IBM, IBM-compatible, and MS-DOS microcomputers.

ITSoftware... ask for IT by name.

For more information, call toll-free (800) 222-0592. In New Jersey, call (609) 799-7500. Or write to us at ITSoftware, P.O. Box 2392, Princeton, New Jersey 08540.

We'll send you our free brochure.

NAME .....

COMPANY .....

TITLE .....

ADDRESS .....

CITY ..... STATE ..... ZIP .....

PHONE .....

PC2

MARTIN MARIETTA

Martin Marietta Data Systems

CIRCLE 432 ON READER SERVICE CARD

higher level of computer sophistication than that of the typical PC user.

PC/IX versus PC-DOS

For most PC users, the key question about PC/IX is how does it compare to PC-DOS? Figure 2 shows the vast difference in scope and complexity between the two operating systems. PC-DOS still reflects its origins as a compact, efficient system for the single-user PC. PC/IX reflects the origins of UNIX as a minicomputer operating system that supports the development of multi-user programs.

With the introduction of PC-DOS 2.1 and 3.0, however, PC-DOS versions have been steadily moving closer to UNIX. They already incorporate a hierarchical file system, pipes, and input/output redirection. PC-DOS 3.1 will include multitasking support. Future versions of DOS will probably continue the trend toward UNIX features.

Despite this convergence of the two operating systems, PC/IX still enjoys a major advantage over PC-DOS in the depth and sophistication of its utilities. An excellent example is the PC/IX utility `grep`, which searches files for occurrences of a particular pattern. PC-DOS 2.1 includes a similar utility, called FIND. But the PC-DOS utility allows matching only on a literal string of characters, whereas `grep` supports full pattern matching based on regular expressions. Similar contrasts can be drawn for the other UNIX utilities that have DOS counterparts. Furthermore, the vast majority of the UNIX utilities that support text processing, program development, communications, and file processing have no parallel under PC-DOS.

Performance

If you are accustomed to a UNIX time-sharing system, you may find that PC/IX has an unusual performance profile. Operations that mostly display information on the screen occur very fast. The `INed` editor, for example, has a very quick feel compared to a full-screen editor running on a time-sharing terminal. Disk-intensive operations, on the other hand, feel very slow. Copying files and loading programs takes much longer than on a UNIX-based mini or supermicro system. CPU-intensive operations fall somewhere in between. If you are accustomed to a heavily loaded VAX/UNIX system, you will probably find that the dedicated 8088 microprocessor in the XT offers CPU power similar to your "share" of the VAX.

To gauge the performance of PC/IX, we ran the *Unique Multiuser UNIX Bench-*

SOFTWARE ADVISOR'S
telasoft
CALL TOLL FREE 1-800 IBM ONLY
Order Line: 1-800-426-6659 • Order Processing & Other Information: 602-224-9345 • Order Line Hours: Mon-Fri 8:30 - 5:30 Saturday 9-1
Address: 1943 East Indian School Road • Suite 194 • Phoenix, Arizona 85016
for VISA and MasterCard • Shipping and Handling add $5.00 • Second Day Air $8.00
AMERICAN EXPRESS MasterCard VISA • Personal and Company checks will delay shipping 2 weeks • [illegible] Add [illegible] for Shipping & Handling • Call on Purchase Orders

SOFTWARE SPECIALS

FRAMEWORK	$365	SYMPHONY	$425
dBASE III	$365	LOTUS 1-2-3	$299
UPGRADE TO dBASE III	$129	SUPERCALC 3	$165
UPGRADE TO SYMPHONY	$139	VOLKSWRITER DELUXE	$155

WORD PROCESSORS
Bank Street Writer $ 50
Leading Edge Word Processor 49
Multimate 255
PFS: Write 79
PFS: Proof 55
The Word 225
The Word w/Mouse 285
Word Perfect 229
Word Plus Spell Checker 90
Wordstar w/ Tutor 189
Wordstar Pro Pack 275
Wordstar Pro Pack Plus Call
Wordstar Pro Option 155

PROJECT MANAGEMENT
Harvard Project Manager $229
Project 155

INTEGRATIVE SOFTWARE
Electric Desk $195

UTILITIES
Copy II PC $ 29
Desk Organizer 185
Fancy Fonts 135
Norton Utilities 48
Prokey 3.0 79
Sidekick 35
Sidekick (Unprotected Ver) 59
Sideways 35
Turbo Pascal 35

TRAINING
ATI for IBM $ 45
CDEX for IBM 43
Flight Simulator (New Version) 32
Speed Reader II 45
Mastertype 30
Typing Instructor 35
Typing Tutor III 30

Advanced DB Master $357
dBase Manager II 165
Friday 165
Knowledgeman 279
PFS File 79
Power-Base 239
Quickcode III 148
R: Base 4000 275
R: Base Clout 115
R: Base Extended Report Writer 89
Think Tank 105
Versaform (PC & XT) 235

ACCOUNTING
BPI General Accounting $359
BPI Accounts Payable 359
BPI Accounts Receivable 359
BPI Payroll 359

MONEY MANAGEMENT
Dollars & Sense $ 99
Tobias's Managing Your Money 115

COMMUNICATIONS
CompuServe Starter Kit $ 25
Crosstalk XVI 99
PFS: Access 55
Smartcom II 85

SPREADSHEETS
Multiplan $119
Chart 150
PFS: Graph 79
PFS Report 71

For Your *Macintosh* Software Needs call:
1-800-MAC-ONLY
Call for FREE subscription to the *Software Advisor Newsletter*

11-3

CIRCLE 170 ON READER SERVICE CARD

Hard Disk, Soft Shell

The Complete Hard Disk Solutions For Desktop & Portable PC's 10 Megabytes $794, Or 20 Meg $1288.

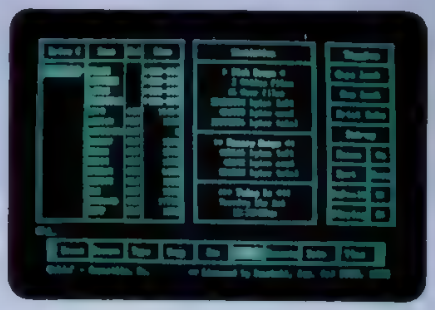
We have the whole package you need to add a hard disk to your IBM PC or compatible. Our half-height 10 and 20 megabyte drives have the lowest current draw in the industry. Unlike most aftermarket hard disks ours can "boot" direct from the hard disk. No software patches, or drivers to install just a copy of IBM PC DOS 2.0 or 2.1.

Idirfully Easy with the popular *Idir* menu driven "visual shell" software. It replaces complicated DOS commands with menus that allow you to just point at what you want to do. Help files explain DOS commands and give you on-line advice when you need it. *Idir* takes the wonder out of the tree structured subdirectories so useful in organizing a hard disk.

Hard Problems like excessive current draw and heat have until now been unsolved problems with aftermarket hard disks. Most drives draw lots of power. If your PC has many expansion boards in it, power to run a hard disk is probably not available. Hard disks have also been easily damaged by vibration and movement. And of course the problem any non-IBM product must face, compatibility with the IBM PC. We have tackled all these problems and come up with the best solutions available at any price.

Cool & In Control with half-height drives so efficient they *draw the same amount of power as a floppy disk* drive. This means a minimum of heat inside your PC with more power available for expansion boards. The controller uses LSI technology to provide fewer components, drawing less power, and giving significantly im proved performance over the IBM XT.

The Portable Plus is 10 or 20 megabytes to go. In fact, the drives we use have been selected by several computer makers for use in their portable computers. Their plated recording media helps withstand vibration, and allows the drive to be used at any angle.



Total Compatibility is a necessity. Our hard disks have the ability to boot directly from the hard disk. Check around, very few aftermarket systems can. In fact, all you need is a copy of DOS 2.0 or 2.1 and you are ready to go, no software drivers to install, or DEBUG patches to apply.

Why Buy From Us? It's simple really. Better value, and no hassles. You see, the price advertised is the whole price. No extra for freight, credit cards, COD fees, or insurance. Perhaps the best part is if you have a question you deal direct with Qubie'. We have the knowledge and ability to help you quickly. And, *if you do have a hardware problem during the warranty period it is fixed or replaced within 48 hours!*

No Risk. Don't be afraid to save. Our manual is written so even the novice can successfully install his own system. And remember, if for any reason you are not happy within 30 days of purchase you may return it for a full refund, and we'll pay the freight back! Get our competition to make the same offer, and find out which system is best. We know which one you will choose.

System Requirements: Any IBM PC with 64k RAM and PC DOS 2.0 or later. Compatible owners call for application information.

PC10: Includes 10 Megabyte drive, controller, cables, installation instructions, *Idir* software, and 1 year warranty. **$794**

PC20: Same as above with 20 Megabyte drive. **$1288.**

Options: Auxiliary power supply, for those with computers already full of power hungry expansion boards. #PCPWR $88.

Half-height bezel (specify computer). #HHBZL $15.

DEALER AND QUANTITY PURCHASE INQUIRIES INVITED

CIRCLE 383 ON READER SERVICE CARD

Idir Directory System Included

Order Today, Shipped Tomorrow!

Price includes UPS surface freight and insurance. Add $12 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

QUBIE'

4809 Calle Alto
Camarillo, CA 93010

Tempo House, 15 Falcon Road,
London SW11, United Kingdom

9/62 Blackshaw, Mortdale
2223 N.S.W., Australia

mark, a standard benchmark suite for measuring UNIX-based supermicro systems. The benchmark tests the commercial performance of a UNIX system under a multitasking load. It consists of three separate tests: the CPU-intensive test uses the UNIX sort utility on a small file to test CPU-related data processing performance; the terminal-intensive test outputs streams of characters to user terminal(s), measuring the terminal I/O performance of the system; the disk-intensive test checks disk I/O performance by reading sequentially through a disk file. Each of the tests is first run by itself (standalone) and then in a multitasking mode together with the other tests (single load). Finally, the multitasking load is doubled (double load) by running the single load test in parallel with itself.

Figure 3 presents the benchmark results for PC/IX and compares them to a minicomputer-based, UNIX time-sharing system and a multi-user, 8086-based supermicro. The performance graphs measure throughput, expressed as a relative percentage of the standalone UNIX-based minicomputer system.

The CPU performance graph shows the PC-XT with roughly 25 percent of the raw CPU horsepower of the PDP 11/70. However, the minicomputer's CPU performance degrades rapidly under load, as the CPU is consumed with terminal I/O and other tasks. A lightly loaded PC/IX system (running a few tasks on behalf of a single user) thus compares very favorably with the minicomputer under a multi-user load that is moderate to heavy.

Terminal I/O performance is one of PC/IX's strong points. Again, the PC-XT's performance is comparable to that of the minicomputer's terminal under multi-user load. Note that the PC is capable of much higher screen I/O performance using low-level programming techniques typical of popular PC-DOS applications. Standard UNIX utilities, however, are written for character-oriented I/O through a well-defined system call interface and do not use these techniques.

The disk I/O test shows a large difference in performance between minicomputer disks and the PC-XT's relatively slow 5¼-inch hard disk. Disk performance on the PC-XT suffers even further with its 8-bit I/O bus, as compared with the 16-bit bus found on minis and supermicros. PC/IX delivers only about one-

IT'S A MODEM!
IT'S A PHONE IT'S BOTH

The Ameritec™ modem is a 300/1200-baud intelligent modem inside a high-quality, two-line telephone. It lets you mix voice and data easily, and it all fits into one small desktop footprint—with less cable tangle.

Special Introductory Price
$649 Plus $3.50 shipping and handling

Order through PC Brand
1-800-722-7263
(in New York State, (212) 410-4001

That's a clever modem in there—autospeed, autodial, autoanswer, full duplex, asynchronous Bell 103/212A compatible. Works with all RS-232C-equipped systems. It's so intelligent it's Hayes compatible. How compatible? It runs with Smartcom II™, Hayes' own communications program, and other packages designed for the Hayes.

It's all the telephone you need, too—2 lines, selectable pulse/tone dialing, memory-dial with installed battery back-up and hold. Together, modem and phone give you instant switching between voice and data, and vice versa, without disconnecting and calling back, plus data monitoring—with its own volume control. Yet the Ameritec modem sells for the price of a high-speed modem alone. It's like getting 2 full-function telephones free. And the Ameritec modem is U.S. made and carries a 2 year parts and labor limited warranty.

ameritec CORP.
345 East 86th St., NY, NY 10028

Hayes & Smartcom are trademarks of Hayes Microcomputer Products, Inc. Ameritec is a trademark of Ameritec Corp. PC Brand is a trademark of PC Brand. Copyright © 1984 Ameritec Corp.

CIRCLE 109 ON READER SERVICE CARD

YOUR LINK TO THE FUTURE OF MICROCOMPUTING

New hardware that will change the way you do business

Novel applications of existing technology

Who are the leaders and what are they doing?

Technologically advanced—User literate

COMPUTERS & ELECTRONICS

is your state-of-the-art link to technology and innovations of microcomputing. No other magazine ties you into the developments *and* the developers of the future of microcomputing quite like COMPUTERS & ELECTRONICS.

Your subscription to COMPUTERS & ELECTRONICS brings you the latest developments in hardware, software and peripherals—and the impact these products will have on you, today, and in the future! You'll have an open forum with the developers of new worlds of technology and processing! You'll be an active part of today, while blazing new paths towards tomorrow!

Open your link to the future of microcomputing the way you want it—the way you need it!

SUBSCRIBE TO COMPUTERS & ELECTRONICS AND SAVE UP TO 32%!

Computers & ELECTRONICS

P.O. Box 2774
Boulder, Colorado 80322

YES! I want a direct link to the future of microcomputing.

Please send me COMPUTERS & ELECTRONICS for:

- ☐ 8 issues for $8.97. *I SAVE 21%!*
- ☐ 1 year for $12.97. *I SAVE 24%!*
- ☐ 2 years for $22.97. *I SAVE 32%!*

Savings based on full one-year (12 issue) subscription price of $16.97.

Mr./Mrs./Ms. _____
please print full name

Company _____

Address _____

City _____ State _____ Zip _____

Check one: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No. _____ Exp. Date _____

Add 40¢ an issue in Canada. Add 70¢ an issue in all other foreign countries.
Please allow 30 to 60 days for delivery of first issue

CE8Z029

sixth of the minicomputer's raw disk performance. Disk-intensive applications will suffer the most when moved to the PC from other UNIX-based environments.

PC/IX is a complete, full-featured UNIX implementation for the IBM PC-XT. Under PC/IX, the PC-XT becomes a viable single-user UNIX system for developing programs, processing text, and executing user-developed UNIX applications. The PC-XT's performance under PC/IX, while not stunning, is certainly adequate. If you are accustomed to using UNIX on a PDP-11 or VAX time-sharing system, you will find PC/IX's performance comparable to those systems under a moderately heavy load.

With its communications capabilities, PC/IX also makes the PC-XT an excellent UNIX workstation when connected to a larger UNIX multi-user system. This configuration may be the most appealing application for PC/IX; it offers the user the convenience and responsiveness of a personal UNIX system, coupled with the mass storage capacity and file-crunching power of a larger system.

An Open Question

Despite the appeal of PC/IX as a UNIX implementation for the PC, two broader factors may stand in the way of its potential market success. The first of these factors is the lack of applications software. Although the body of software now available for UNIX-based supermicros is growing rapidly, vendors have thus far ported little of it for use under PC/IX. UNIX-based software vendors have also traditionally relied on manufacturers and OEMs for distribution; to offer software under PC/IX, they need new retail and Fortune 500 distribution channels.

The second factor is the uncertain position PC/IX occupies in the IBM PC product line. With the introduction of XENIX for the PC AT in August, two different UNIX versions are now available from two different IBM organizations. PC-DOS 3.1, with its support for multitasking and PC networking, represents yet another alternative. Which one of the three operating environments will dominate in the long run is still an open question. ■

Jim Groff and Paul Weinberg are the coauthors of Understanding UNIX: A Conceptual Guide *published by Que Corporation, Indianapolis, Indiana*

CIRCLE 105 ON READER SERVICE CARD

In A World Of Blue-Sky Promises, We Get IBM Specific.

The Using Your IBM PC Series from CBS Computer Books now adds *more* power to your performance with 10 brand new, up-to-the-minute titles! No other line offers users at all levels a broader range of applications specific to the IBM PC family. And with more than 30 titles now available, there's a book in the IBM PC Series to fill every data gap on your bookshelf. The IBM PC Series from CBS Computer Books stays one step ahead—so you can. **Look for our full line of IBM titles wherever computer books are sold.**

Programming the IBM Personal Computer: Fundamentals of BASIC
By Neill Graham. The briefer, updated version of Graham's earlier book on BASIC, hailed by reviewers as "excellent" (*Data Processing Digest*) and "a must" (*Byte*). $18.45

Executive Computing in BASIC: The IBM PC
By Peter Mears. A step-by-step, "hands on" guide to BASIC programming, written specifically for business users. $20.45

Using the IBM PC: IBM EasyWriter
By Ada W. Finifter. The only IBM specific EasyWriter book available shows users how to get the most from this popular word processing system. $18.45

Using the IBM Personal Computer: Keyboarding
By Peter Mears. Increase your keyboarding skill with this book-and-disk package featuring exercises and drills that keep pace with your progress. $35.45

Programming the IBM Personal Computer: Assembly Language
By Chao C. Chien. Chien's crystal clear, learn-by-doing approach will have you writing Assembly Language programs in no time. $18.45

Programming the IBM Personal Computer: Cobol
By Neill Graham. Only an expert like Graham could introduce the IBM PC version of Cobol so clearly—and provide so much information business users won't find in the IBM reference manual. $20.45
Also available with disk at $40.45

Using the IBM PC: Organization and Assembly Language Programming
By Mark A. Franklin. Essential hard-fact information for users with some background in higher-level languages. $20.45

Using the IBM PC: WordStar
By C. J. Puotinen. WordStar from A to Z, organized into 36 "byte-sized" chapters to speed comprehension and cut learning time. $18.45

Using the IBM PC: MultiMate
By C. J. Puotinen. The first book available on using one of today's hottest word processing programs on the IBM PC. Designed for first-time users and written with the support of the software's developers. $20.45

...And a FULL-COLOR activity book for you and your kids!

Nudges: IBM LOGO Projects
By Steve Tipps. Close to 100 projects focusing on math, art, music, and logic make learning LOGO fun for all ages. Written with the technical support of IBM. $16.95

CBS Computer Books
FROM HOLT, RINEHART & WINSTON
When A Help Command Isn't Enough

All prices subject to change without notice

CIRCLE 125 ON READER SERVICE CARD

CBS/HOLT, RINEHART & WINSTON, Division Marketing Unit, 383 Madison Avenue, New York, NY 10017

HOW THE MANAG BIGGEST BUSINESS PU

"With four billion customers and the world's biggest inventory, it's a wonder I'm out the door on time each Christmas Eve.

"But this year, I'll have time to spare. That's because I've got Clout™—the new software program from Microrim® that lets me conveniently get at information from every department in my company.

"How conveniently? By letting me ask questions of my personal computer in my own words. Just like I'm talking to you now."

"IT WRAPS UP FILES FROM LOTUS 1-2-3,™ PFS:FILE,™ DBASE II,™ OUR MAINFRAMES AND MORE."

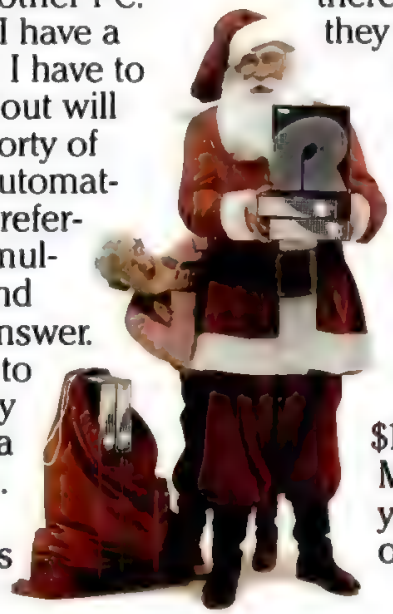
"Besides the shop up here at the Pole, I have to oversee manufacturing plants all over the world. And at each facility, they keep track of their work by using the leading productivity packages on the market today. Including Microrim's own R:base™ DBMS software.

"In the past, it used to be near impossible to pull

ER OF THE WORLD'S LLS IT ALL TOGETHER.

information together from different sources, without re-entering every bit of the data. But the new Clout takes data files directly from these programs—plus ASCII, DIF, and SYLK files, too. So I can get information from other PCs by sharing floppy disks. Or being part of a LAN. Clout can even read files which have been transmitted from the company mainframe or another PC.

"Anytime I have a question, all I have to do is ask. Clout will scan up to forty of these files automatically, cross-reference five simultaneously, and there's my answer. I don't have to know exactly how the data is organized. Or even in which file it's stored."



"'WHICH WAREHOUSES SHIPPED MORE RED AND GREEN ARGYLE SOCKS THAN PLANNED?'"

"Try typing that into any software package you know. Using exactly those words. Likely all you'll get is a blank stare from the screen.

"But with Clout, I get a clean, crisp list. No computer jargon. No need to check it twice. Just straightforward answers.

"I also use Clout on the corporation's financial files. For example, my elves enjoy a well-deserved bonus as much as the next elf. So I entered, 'Which departments were over quota last quarter?' I was happy to find that there were plenty. But they were even happier to get the bonus."

"BEAT THE CHRISTMAS RUSH. GET A DEMO TODAY."

"Want to see how easy it is to pull *your* business together? For only $14.95 (plus shipping) Microrim will send you a demo/tutorial of Clout. Just call 1-800-547-4000, Dept. 908. In Oregon, or outside the U.S., call 1-503-684-3000, Dept. 908. Or drop by your nearest software store.

"It could be the best present you'll ever give yourself."

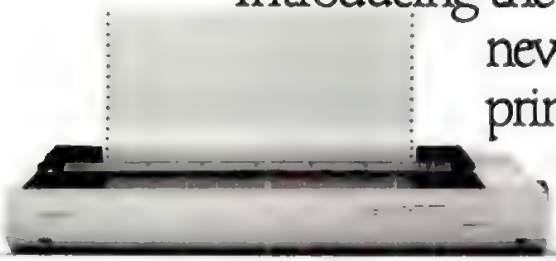
CLOUT™
FROM MICRORIM®

Requires 256K of memory. Runs on MS-DOS and PC/DOS operating systems. Hard disk recommended.

CIRCLE 184 ON READER SERVICE CARD

CITIZENS AGAINST UGLINESS, UNRELIABILITY, HASSLES AND HIGH PRICES.

Copyrighted material



Introducing the Citizens. A whole new line of dot matrix printers, precision-engineered by the people who've become a wristhold word in fine, precision-engineered watches.

The Citizens are very sleek, very quiet, and reliable as the day is long.

They're IBM® or Epson®-compatible, with output speeds of 160 cps, or 40 cps correspondence-quality at the flick of a switch.

They're also exceptionally easy to use, thanks to our unique new push-feed paper loading system.

And if all this weren't enough to tick off the competition, wait 'til you see what a value Citizen™ is for the money.

Stop by one of our dealers today and watch what the Citizens can do for you.

For more information, call 1-800-556-1234, Ext. 34. In California, 1-800-441-2345, Ext. 34. Or write Citizen America Corporation, 2425 Colorado Avenue, Santa Monica, CA 90404.

CITIZEN

© 1984 Citizen America Corporation. Citizen is a trademark of Citizen America Corporation. IBM is a registered trademark of International Business Machines Corporation. Epson is a registered trademark of Epson Corporation.

CIRCLE 113 ON READER SERVICE CARD

SOFTWARE • GLENN A. HART

Delving into dBASE III

We've scrutinized the commands and functions in dBASE III to see where it's improved over its predecessor, dBASE II, and where it's not.

Illustration: Greg Couch

Using *dBASE II*, the leading database management program for the PC, has always been something of a love-hate affair. It's easy to love the interactive environment, the ease of creating a database and entering data, the ability to get reasonably complicated tasks done quickly and easily, and the flexibility and speed of coding that *dBASE II* makes available to the more advanced user and programmer. On the other hand, *dBASE II*'s limitations and poor performance are often enough to drive you straight up a wall. Its maximum number of fields is constricting; its limited data types are primitive; its language is often awkward and, especially in its early versions, buggy; and, perhaps worst of all, its execution is *slow*.

Now *dBASE II* publisher Ashton-Tate has introduced *dBASE III*. Ashton-Tate does not consider *III* an upgrade of *II; dBASE II* will continue to be sold for both 8-bit and 16-bit systems. The new *dBASE III* is available initially only for IBM PCs and compatibles, but it may be available for other 16-bit systems later. Since the new product is written in the C language rather than in assembly language, porting it to a wide spectrum of computers should be reasonably easy. This portability is important to commercial software developers considering *dBASE III;* the more systems the product runs on, the greater the market potential. *dBASE III* retails for the same $695 long charged for *dBASE II*, while the earlier version's price has been dropped to $495.

The major improvements in *dBASE III* are in database constraints, user interface, language enhancements, documentation, and speed of execution. I'll cover each in turn. During *PC*'s massive "Project: Database" series, I looked at a prerelease beta version, but here, I have reviewed the actual production product.

Database Limitations

dBASE II suffers from several design limitations that reduce its usability in some circumstances. The most serious is its 32 field limitation. While tricky programming can sometimes circumvent this limitation (see "Advanced dBASE II Programming Tricks," *PC*, Volume 3 Number 2), certain applications cannot use *dBASE II* because of the small number of fields available.

Some of the other *dBASE II* limitations present more problems to the advanced user or programmer than to beginners. Having only two files open at a time often leads to clumsy file manipulations, and the limit of 64 memory variables also demands some fancy footwork in complex applications. The *dBASE II* limits of 65,000 records and 1,000 characters in a record and its limited math accuracy are not as often a problem, but serious business applications sometimes run afoul of these restrictions as well.

If you look at the table in Figure 1, you can see that *dBASE III* addresses these constraints with a vengeance.

Even these increases don't tell the whole story. It is difficult to manipulate long text fields with *dBASE II* because of its 254 character limit on a character field (a limit retained in *dBASE III*, by the way). To circumvent the problem, *dBASE III* adds a new field type called Memo. Each Memo field takes ten characters in the data file as a sort of place holder. The actual text can be up to 4,000 characters if *dBASE III*'s built-in text editor is used or up to an incredible 512,000 if an external word processor is used to create the text. The actual text is stored in a separate file linked to the main data file. Thus it might be fair to say that *dBASE III* records can be up to half a megabyte each!

dBASE III also adds another new field type to store date information. While date manipulation can be programmed in *dBASE II*, it is complex and cumbersome. *dBASE III* handles dates in a simple manner and includes a long list of functions to convert dates to character strings and do date calculations.

The bottom line is that programmers using *dBASE II* often run into that program's limitations like a truck running into a brick wall. That collision simply won't happen with *dBASE III*. It can store and manipulate immense amounts of data, and its limitations on fields, memory variables, and open data files are unlikely to be a problem.

User Interface

dBASE II has always been notorious for its cryptic user interface. After the program signs on, a bare and uninformative period appears as a prompt. That's it—no menus, no messages, no nothing. While later versions of *dBASE II* include a help provision that allows you to ask for information on specific commands, this function is only a slight improvement. Executing some of the commands results in no

dBASE III
Ashton-Tate
10150 W. Jefferson Blvd.
Culver City, CA 90230
List Price: $695
Requires: 256K RAM, two disk drives, DOS 2.0.

CIRCLE 733 ON READER SERVICE CARD

	dBASE II	dBASE III
Fields per record	32	128
Records per data file	65,535	1,000,000,000
Characters per record	1,000	4,000
Open data files	2	10
Numeric precision	10 digits	16 digits
Memory variables	64	256

Figure 1: *Differences in capacity between* dBASE II *and* dBASE III.

SEE SPOTLIGHT RUN

Introducing Spotlight.™
Note it. File it. Schedule it. Calculate it. Save it. Find it fast.

The Spotlight™ program is a set of convenient desktop accessories all in one package. No matter which application program you're working in – including VisiCalc,® 1-2-3,™ WordStar,® dBase II,® pfs:File,® MultiMate,® MicroSoft Word,™ TK!Solver,® and Symphony™ – Spotlight gives you instant access to six essential functions.

Just a keystroke suspends your application program and gives you a window into Spotlight. Another keystroke gets you back to where you were just as fast. It's that easy.

Here's what you get:

Appointment Book – schedule daily and weekly meetings or display monthly calendar. Set a sound alarm to remind you of appointments, even if you're using another program.

DOS Filer – perform operating system tasks without leaving your program. List, create, delete, copy, and sort files and directories. Even format disks.

Phone Book – find and instantly display any name, address and phone number from 36 available lists. Each list can hold 500 different entries.

Note Pad – jot a note or write and edit messages up to eight pages long.

Index Card File – search up to 36 separate files, each of which contains 500 cards. Cards are alphabetically sorted.

Calculator – calculate any problems and insert the answers into the program you're using.

Spotlight is the great program behind any great program you use.

System requirements: IBM® PC or XT,™ or COMPAQ® portable computers, one disk drive, 75K memory for RAM resident portion, DOS 2.0 or higher. Printer optional. Can be installed on hard disk. Runs with most IBM PC software packages.

Spotlight™
By Software Arts™

27 Mica Lane, Wellesley, Massachusetts 02181

CIRCLE 212 ON READER SERVICE CARD

HOW TO RULE

ADMIT IT. You've always wanted control. It was there in your daydreams as you drove to work. The ones in which there's a subtle change in your boss's tone of voice. Your office begins a steady march toward the corner. And suddenly, you're C.E.O. with six phones and the world at your feet.

What was it that kept getting between you and that goal?

We suggest you were disorganized. No more than most, to be sure. But then, things did sometimes get lost, confused, forgotten.

You can't rule the world *that* way.

A TINY AD FOR PEOPLE WHO LIKE FACTS AND FIGURES.

Machine requirements:

IBM-PC, XT, COMPAQ, or other 100% IBM compatible personal computers with 256K min. RAM and 1 double-sided disk drive. Color or monochrome display

Performance data

2 keystroke mail merge. 1 keystroke express between all applications. Cut & paste between all applications. Word processor features include bold face, underline, headers & footers, print preview, quick-set margins, full justification, visible page breaks, templates and much more. Less than ½ sec. to perform all word processor editing functions. Accepts ASCII files from other popular software. Window locations, sizes and colors customizable by user. One key auto phone dialing

WE CAN FIX THIS. We have a personal computer program called *Get Organized!* It will organize your life. Quickly and painlessly.

To be exact, *Get Organized!* is 7 different business programs integrated on one floppy disk. It puts everything most managers keep on their desks into your computer. And it does this in such an organized, instinctively easy-to-use way that you'll be using it and benefiting from its power and precision as little as ½ hour after paying for it.

Sound interesting?

A COMPETITIVE ANALYSIS. Compared with *Symphony* and *Framework*, the price of *Get Organized!* is dramatically low—almost $500 lower on a straight list-price to list-price comparison. And *Get Organized!* will run on far less expensive machine configurations. In fact, what you'll save on disk drives and memory alone could pay for a decent printer.

Perhaps the best way to summarize the significance and value of *Get Organized!* is by telling you the following story:

When we exposed IBM-PC owners to *Get Organized!* in secret marketing tests this summer, a good number of them offered to pay us 5 times the list-price for an advance copy.

What do you think *they* had in mind?

THE $4.99 TRIAL OFFER. If some of you feel that the claims we've made for *Get Organized!* sound too good to be true, we have a cure.

Call us. Our number is (800) 227-6703. (In California call (800) 632-7979.) Give us your VISA or MasterCard number. For a $4.99 handling fee, refundable upon purchase of *Get Organized!*, we'll speed a demonstration copy your way (on Verbatim disks, no less). At which point your skepticism will go the way of the morning dew.

Now then. Armed with your own copy of this remarkable value in business software, go forth, think straight, and you will surely rule whatever it is you wish to rule.

If not, you have hereby lost one of your best excuses.

1 A Full-Featured Word Processor. *You're Julius Caesar. You'd like to rule the world, but first you have to write a book about how all of Gaul is divided into three parts and so forth. You do not have Get Organized! Your writing becomes slow, mistake-ridden and arduous. The Senate becomes impatient. You know the rest.*

2 The Address & Telephone File. *If you were Adlai Stevenson and you had Get Organized! you'd have compiled a mailing list of wealthy and influential supporters. Merging this with the Word Processor would have given you a hard-hitting, personalized direct mail campaign. Your budget would have ambushed Ike. And, with the Russians oblivious of the ambitions lurking beneath your liberal exterior, you could have plucked the world like a ripe plum.*

3 The Handy Notepad. *You're Napoleon. You're in the study when your wife Josephine comes in and tells you, "Ze pipes are broken and zere is water in ze loo." "Ah weel feex that thing," you tell her, but since you don't have Get Organized!, you scribble down a note to yourself on the nearest paper which, unfortunately, turns out to be the Order of the Day. Nine hours later your army is clobbered in a Belgian village you never heard of.*

GET ORGANIZED!™

The personal work manager from ELECTRONIC ARTS™

Get Organized! is a trademark of Electronic Arts, Inc. IBM is a trademark of International Business Machines, Inc. Compaq is a trademark of Compaq Computer Corp. CompuServe is a trademark of CompuServe, Inc. Dow Jones is a trademark of the Dow Jones Company. MCI and MCI Mail are trademarks of MCI Communications

THE WORLD for $199.

4 The Calendar And Appointments Book.

You're Hannibal. You have this idea of taking elephants over the Alps to conquer Rome, but being from Carthage, you're a little fuzzy on dates and seasons in Europe. If you had Get Organized! you'd have known better, been able to plan for recurring events (like winter) and won the day. It would have been right there on the screen: "January 1. Invade Rome, Rule World."

5 The TeleComm Package.

You're Queen Victoria. An excited young man arrives with Get Organized! and a curious metal box. He claims they will instantly connect you with the Empire by means of something called "electronic mail" and "a terminal emulator." He promises wealth and knowledge through "The Source," "Dow Jones," "CompuServe," "MCI," and "MCI Mail." His name is H.G. Wells. You decide he is quite mad and dismiss him. A century later, you're lucky to still have the Falkland Islands.

6 The Index Card File.

You're Joan of Arc. You're on a roll, but certain people are threatening to make things too hot for you. Get Organized! would've let you keep up-to-date info on your friends and foes. Like resumes, statistics, or even birthdays. Who knows? The right birthday card to the right Inquisitor at the right time could have made all the difference.

7 The Calculator.

Imagine how useful this would have been if you were John Maynard Keynes. Simple arithmetic would have revealed the terrible flaw in your economic theory. Governments the world over would not be printing worthless money to cover their debts. And this program would be a lot cheaper.

The Source is a trademark of Source Telecomputing, Inc. Symphony is a trademark of Lotus Development Corp. Framework is a trademark of Aston-Tate, Inc. $199 is the suggested retail price for Get Organized! Prices may vary.

CIRCLE 173 ON READER SERVICE CARD

screen indication of program activity. Records are displayed without any indication of the meaning of the fields. Many of the commands would be much more useful if their operation were modified slightly; for example, the BROWSE command allows you to display a screen of fields from many records, but scrolling through a single record is often of limited use because as you move along, the indication of what record the fields are in is no longer displayed.

dBASE III corrects almost all of these weaknesses. While the naked period is retained as the operator prompt, various options help you. The ASSIST command invokes a complete menu-driven system that allows interactive use of many of the available commands, even by inexperienced users. The full-screen menus are beautifully integrated with the PC, through use of the cursor control keys, screen highlighting, and other PC functions to simplify operation. Helpful explanations for all functions make ASSIST a valuable learning tool as well as a viable way to use the program (see Figure 2).

Time-consuming processes usually trigger a "tachometer" display in *dBASE III*, in which the progress of the process is shown as a fixed-position counter. For example, with the INDEX command a count of each record indexed is shown. With SORT you see the percentage complete, while for COPY FILE, the screen even shows the number of bytes transferred as a file copy is underway. These counters are interesting to watch and reassure you that something is happening.

dBASE III can, at your option, display a heading over output from the LIST and DISPLAY commands, showing the field titles. Prompting menus, somewhat like *WordStar*'s, are available on many commands. The operation of several commands has been improved; BROWSE, for example, allows you to lock fields onto the screen, so when you scroll through a record, its name field remains visible. BROWSE allows records to be added to the database as well.

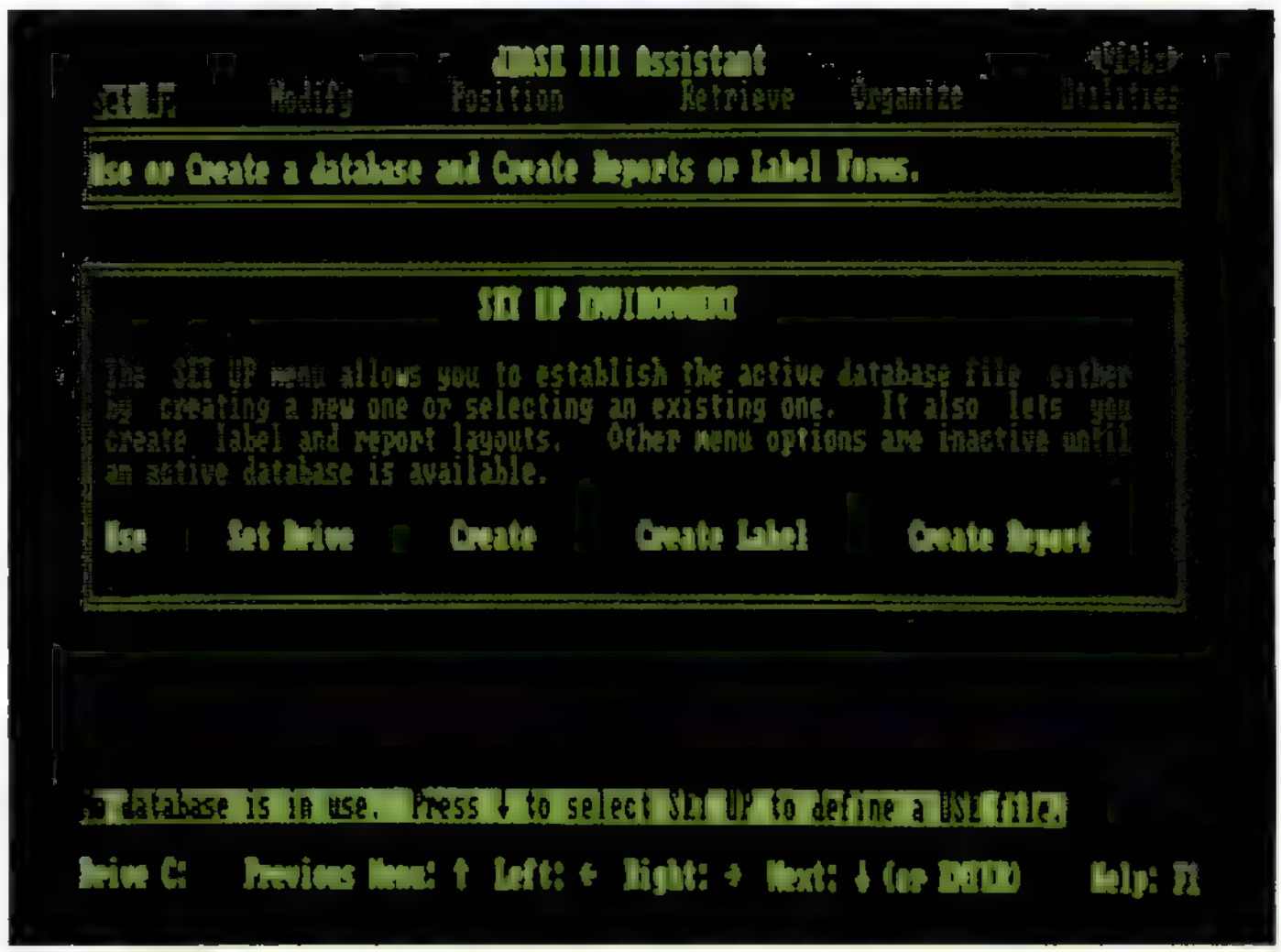


Figure 2: *A* dBASE III *menu screen activated by the ASSIST command.*

Overall, *dBASE III* is much more "comfortable" to use than *dBASE II*. Its integration with the PC is excellent. Although it uses more of the PC's special keys, the old control characters also work, so *dBASE II* users don't have to unlearn old habits. On-screen highlighting and prompting are well done and helpful.

Language Enhancements

The high-level language included with all versions of *dBASE* has always been the main reason for the product's success. The language is more structured than BASIC, although several of the routines usually included in structured languages are absent (REPEAT-UNTIL and FOR-NEXT, for example). In addition, it is quite powerful, primarily because its data management commands are very high-level. Ashton-Tate's early claim that programmers could create complex applications using *dBASE II* in far less time than with more traditional high-level languages has indeed been proven correct. In many cases, you pay for the reduction in programming time with slower execution, but many business users find the trade-off worthwhile, given what programming costs these days.

dBASE III's language is cut from the same cloth as *dBASE II*'s, but the two are not the same. The command word has been changed for several commands and several others work somewhat differently. Although Ashton-Tate doesn't indicate this reason in the documentation, some of the changes seem dictated by the firm's use of C rather than assembly language to write *dBASE III*. Whatever the cause, the new syntax seems just as logical (and in some cases more so) as the old—it's just slightly different.

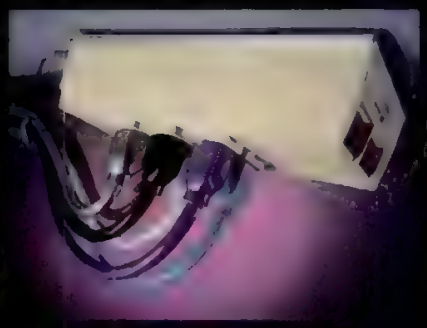
More importantly, several new commands have been added that increase the power of an already powerful language. Notably, the SET RELATION TO command allows data files in any of the ten available work spaces to be linked through common keyed fields. Ashton-Tate modeled the syntax for specifying fields in different data files after records in C and Pascal; it is easy to use and flexible.

One major change that many will consider a step back is *dBASE III*'s inability to execute DO-WHILE statements that con-

LURKING BEHIND EVERY COMPUTER IS THE POWER TO DESTROY ITSELF.

That power cord may look innocent. But it could suddenly turn against your PC.

It could, for example, hurl a power spike from static or lightning into its delicate circuitry. Wiping out its memory. Or destroying a defenseless component.



Don't risk it. Get a 6-outlet Wire Tree Plus™ surge protector from NETWORX™. It guards against spikes. Filters out RF interference. And it's the *only* device with two phone jacks to protect modems against surges.

Other unique features include separate switches for the CPU and peripherals and a bracket that mounts under the front of the workstation. The illuminated switches are easy to reach, and yet recessed, so you can't accidentally shut down power and lose data.

If you don't need 6 outlets, pick up our 4-outlet Wire Tree™. Or our single-outlet Wire Cube™ that's ideal for portable computers.

That'll take care of power surges. But what if your foot gets tangled in a power cord? Prevent this potential disaster with the Wire Away.™ It stores up to four 18-gauge wires and ends the hazardous mess of dangling cords.

All our products are backed by a 5-year warranty. So when you shop for a PC, ask for NETWORX computer station accessories. And don't go home without them.

NETWORX™
Computer Station Accessories

CIRCLE 454 ON READER SERVICE CARD

Pssst. It's

SOFTWARE

Aptec *(for color Prism Printers)*
Rainbow Writer Color Text Formatter $119.
Rainbow Writer Screen Grabber ..... 69.
Ashton-Tate
dBase II ..... 269.
dBase III ..... 369.
Upgrade (dBase II to dBase III) ..... 125.
Framework ..... 369.
Friday! ..... 169.
Reference Encyclopedia *(book)* ..... 55.
Best Programs
Personal Finance Programs ..... 65.
PC/Professional Finance Program II .. 149.
PC/Fixed Asset System ..... 297.
PC/Tax Cut ..... 149.
Bible Research
THE WORD *(KJV Bible - 7 disks)* ..... 145.
Broderbund
Bank Street Writer ..... 59.
Bruce & James
WordVision ..... 39.
Continental
Home Accountant Plus ..... 89.
FCM *(filing, cataloging, & mailing)* ..... 79.
UltraFile *(file,report,graph)* ..... 109.
The Tax Advantage ..... 39.
Digital Research
CP/M-86 ..... 39.
Dr. LOGO *(requires 192k & RGB monitor)* 69.
Financier
Financier II ..... 115.
Financier Tax Series ..... 97.
FriendlySoft
FriendlyWriter *(with FriendlySpeller)* .... 55.
Funk Software
Sideways ..... 45.
Harvard Software
Harvard Project Manager ..... 219.
Hayes
Smartcom II ..... 99.
Please ..... 239.
Get free mailing list template for a limited time - also get a second template of your choice free from Hayes.
Koala
Speed Key ..... see special
Lifetree
Volkswriter Deluxe *(with TextMerge)*... 165.
Living Videotext
ThinkTank ..... 109.
Lotus Development
1-2-3 *(version 1A)* ..... call
Symphony ..... call
Micro Education (MECA)
Managing Your Money ..... 129.
Micropro
WordStar & Propak come with quick lesson CAI training disk and tutorial disk

PC Connection Software Special
through November 30, 1984

KOALA TECHNOLOGIES
Speed Key
If you own a Koala Pad you can "upgrade" it to the Speed Key System with this software package — and learn how to take short cuts through the obstacle courses in many business software programs (see Hardware Special for specifications).
- REQUIRES: Koala Pad or KT 2010 Touch Tablet, game port
- INCLUDES: Software, overlays, manual

..... $55.

Chartstar ..... $209.
Infostar Plus *(w/Starburst)* ..... 299.
WordStar 3.3 ..... 219.
Wordstar Propak *(WordStar/MailMerge/CorrectStar/StarIndex)* ..... 279.
Wordstar Propak Plus *(Wordstar/MailMerge/CorrectStar/StarIndex/Mailing List Manager and TeleMerge)* ..... 359.
Microrim
R:base 4000 ..... 269.
Extended Report Writer ..... 85.
Clout ..... 119.
Microsoft
Multiplan *(ver 1.2)* ..... 125.
Financial Statement (for Multiplan) ..... 69.
Budget Analysis (for Multiplan) ..... 99.
Cash Plan (for Multiplan) ..... 99.
Microsoft Word *(ver 1.1)* ..... 239.
Microsoft Word with mouse *(ver 1.1)* .. 289.
Microsoft Mouse with software ..... 139.
Microsoft Serial Mouse with software .. 139.
Microsoft Project ..... 155.
Microsoft Chart ..... 155.
Microstuf
Crosstalk XVI ..... 99.
Infoscope ..... 149.
Transporter *(includes Crosstalk)* ..... 169.
PCsoftware
PCcrayon II *(new release)* 39
Executive Picture Show 139
CREATABASE ..... 47.
Peachtree
PeachPak Series 4 (G/L, A/R, A/P) .... 189.
Peter Norton
Norton Utilities 49
Rosesoft
Prokey 3.0 ..... 89.
Satellite Software
WordPerfect ..... call

Software Arts
TK!Solver ..... $269.
Software Publishing
PFS/Access ..... 59.
PFS/File ..... 89.
PFS/Graph ..... 89.
PFS/Write ..... 89.
PFS/Report ..... 79.
Softword Systems
MultiMate *(ver 3.22 with spell checker & tutorial)* ..... call
Sorcim
Supercalc 3 ..... 199.
Virtual Combinatics
Micro Cookbook ..... 29.
Soups & Salads *(add on disk)* ..... 15.
VisiCorp
VisiCalc IV *(w/StretchCalc)* ..... 149.
VisiFile ..... 99.
VisiSchedule ..... 129.
VisiTrend/Plot ..... 69.
VisiWord Plus *(with VisiSpell)* ..... 109.
Warner Software
The Desk Organizer ..... 149.

TRAINING

ATI
SKILL BUILDER PROGRAMS
Intro To:
Word Processing — Accounting
Business Software — Data Bases
..... *each* 32.
How to Use:
Compaq — MS-DOS (2.0)
CPM-86 — PC-DOS (2.1)
M-Basic — Home Accountant
IBM-PC — VW Deluxe
PCjr ..... *each* 32.
TRAINING POWER PROGRAMS
How to Use:
dBase II — dBase III — Lotus 1-2-3
MS Word — Easywriter II — Multimate
Multiplan — Supercalc 3 — Framework
Symphony — Wordstar — TK!Solver
Peachtree *(specify A/R,A/P,G/L, sales invoice, inventory)* ..... *each* 49.
Individual Software
The Instructor ..... 35.
Professor DOS ..... 47.
Tutorial Set *(both items above)* ..... 75.
Professor Pixel ..... 47.
Typing Instructor ..... 39.
Scarborough Systems (was Lightning)
Master Type ..... 39.

EDUCATIONAL

Davidson
Speed Reader II *(high school & college)* 49
Math Blaster *(grades 1-6)* ..... 35.
Word Attack *(grades 4-12)* ..... 35.

* DEFECTIVE SOFTWARE REPLACED IMMEDIATELY DEFECTIVE HARDWARE REPLACED OR REPAIRED AT OUR DISCRETION SOME ITEMS HAVE WARRANTIES UP TO FIVE YEARS
* COPYRIGHT MICRO CONNECTION, INC 1984 ALL ITEMS SUBJECT TO AVAILABILITY PRICES SUBJECT TO CHANGE WITHOUT NOTICE IBM IS A REGISTERED TRADEMARK OF IBM CORP Jr CONNECTION AND MICRO CONNECTION ARE TRADEMARKS OF MICRO CONNECTION, INC PC CONNECTION IS A REGISTERED TRADEMARK

PC CONNECTION®

PC Preppy.

Our school colors.

Winter's coming. And up here in Marlow, NH (pop. 543), the trees have been showing more colors and patterns than our most dazzling RGB monitors.

IBM-PC users get more serious as winter approaches. Serious about school, work, sports, and even about storing up those gourmet nuts and berries.

We're serious too—about upgrading your IBM-PC.

Block that kick. Boot that disk.

Our PC add-ons and software regularly find their way into the Big 10, Big 8, Big 3, Little 3, Ivy League, Major Leagues, NFL, AFL, not to mention the Fortune 500.

Need to write five papers by Friday? Want to play Zork after that? Do stats for your football team? Wire your parents via modem and tell them to send money? Create fancy spreadsheets to convince them? Connect your fraternity with a Local Area Network? Tap into Top Secret Pentagon...well, we actually can't help you with that last one. But our summa computer consultants can set you up with the hardware and software you'll need for the most popular school and business applications. Ready to ship. At very intelligent prices.

HARVARD PC CONNECTION PRINCETON

The PC Connection tie. Made to the same oh-so superior standards as your basic Ivy League tie. Limit one per customer. Offer not available to commercial accounts.

Tie one on.

Let other people wear their old school ties. You can show your PC spirit with our modest contribution to PC preppydom—a PC Connection tie. It features our own sophisticated mascot with a most scholarly grin on his face. Very chic. The ties are free to anyone who places a $500.00 order between now and December 31. (And they look as stunning on men as they do on women.)

Just call 1-800/243-8088 or 1-603/446-3383 anytime Monday through Friday 9:00 to 9:00 and Saturday to 5:30. If you're planning to visit us, call ahead to make sure what you want is in stock. The showroom closes at 8:00 M–F and 5:00 Saturday.

For the IBM-PC exclusively.

PC←CONNECTION®

·connection.

SURGE SUPPRESSORS - NEW
Diamond *(similar to EPD Lemon)* ..... $39.
Emerald *(similar to EPD Lime)* ..... 49.
Sapphire *(similar to EPD Peach)* 59
Ruby *(similar to EPD Orange)* ..... 69.

Electronic Protection Devices
All are rated at 1875 watts, 15 AMP.
The Lemon ..... 39.
The Lime ..... 59.
The Peach ..... 64.
The Orange ..... 94.

Epson
RX-80 with GRAFTRAX-Plus ..... call
RX-80 F/T with GRAFTRAX-Plus ..... call
FX-80 with GRAFTRAX-Plus ..... call
RX-100 with GRAFTRAX-Plus ..... call
FX-100 with GRAFTRAX-Plus ..... call
LQ-1500 *(letter quality dot matrix)* ..... call
Printer to IBM Cable (specify printer) ... 32.

FTG Data
Light Pen (Push Tip) ..... 195.
Demo Disk Set for Light Pen ..... 39.

Hayes
Smartmodem 300 ..... 209.
Smartmodem 1200 ..... 489.
Smartmodem 1200B *(w/Smartcom II)* 409.
Smartcom II ..... 99.
Compucable's Smartmodem-to-IBM Cable ..... 25.

Hercules Computer
Hercules Graphics Card *(parallel port)* 339.
Hercules Color Card *(parallel port)* .... 179.
Graph-X Software ..... 42.

key tronic
Deluxe keyboard (KB 5151) ..... call

Koala
Koala Touch Tablet *with software (connects to game port)* ..... 89.
Speed Key System ..... see special

Kraft
Joystick ..... 39.

Maynard Electronics
Floppy Drive Controller ..... 135.
Internal Hard Disk (10 Meg),WS-1 Controller & ROM for PC mother board ..... 879.
Internal Hard Disk (10 Meg) WS-2 Controller & ROM for PC Mother Board ..... 1079.

Mouse Systems
PC Mouse (w/software & desk pad) ... 149.

NEC
Pinwriter P2(IBM) 80 col ..... 679.
Pinwriter P3(IBM) 132 col ..... 897.
Spinwriter 3550 *(IBM-PC compatible)* 1499.
Spinwriter 2050 *(3550's little brother)* .. 789.

Orchid Technologies
All Orchid Boards come with PCnet Drive (Ram disk), PCnet spool (print spooling), disk caching & partitioning.

Blossom 64k upgradeable to 384k, with clock calendar, serial and parallel ports 239

PCnet Daughter Board (piggybacks to Blossom) with version 2.4 networking software ..... call
PCnet Blossom 64k Blossom Board with the Daughter Board installed ..... call
Diskless Boot Rom, Cluster Kit etc. .... call

Plantronics/Frederick
COLORPLUS *(with Color Magic)* ..... call

Princeton Graphics
HX-12 RGB monitor *(690 x 240)* ..... call
SR-12 RGB monitor *(690 x 480)* ..... call
Scan Doubler Board (for SR-12) ..... call
MAX-12 Amber monochrome monitor .. call

Quadram
New Expanded Quadboard 64k expandable to 384k, with clock calendar, parallel, serial & game port, I/O bracket, and Quadmaster software ..... 269.
Microfazer Printer Buffer (parallel) w/copy MP 64 (64k) *upgradeable to 512k* .... 197.
Quadcolor I ..... 197.
Quadchrome II ..... 469.

SMA (Systems Management)
PC-Documate Keyboard Templates *available for:*

DOS/Basic 1.1	Supercalc 3
DOS/Basic 2.0-2.1	Wordstar
Lotus 1-2-3	Turbo Pascal
Symphony	WordPerfect
Multiplan (IBM)	dBase II
Multiplan (Microsoft)	dBase III
Peachtext 5000	Framework
Easywriter II	Multimate

Volkswriter Deluxe ..... *each* 12.

STB
Graphix Plus II (new version) ..... 349.

TG
Joystick ..... 45.

USI *(monitors for graphic board)*
Pi-2 Monitor (12" green, with cable) ... 119.
Pi-3 Monitor (12" green, with cable) ... 129.

DRIVES

All drives are completely pre-tested. Specify Drive A or Drive B for your PC. Comes with complete step by step installation instructions. Drives are 320k/360k.

Tandon
TM 100-2 (5¼") *full-height drive (DS,DD)* 185.

TEAC
FD-55B(5¼") *half-height drive (DS,DD)* 159.
Free 'y' cable & bracket with each pair.

MEMORY

Memory prices are coming down.
64k Memory Upgrade Set for IBM-PC or XT system board ..... 55.
64k Memory Upgrade Set for any memory board *specify make of board* ..... 55.
Install memory upgrades & run diagnostics *at time of board purchase only* ..... 10.

DISKS

Verbatim *(with 5 year guarantee)*
Datalife Disks SS/DD *plastic box of 10* 23.
Datalife Disks DS/DD *plastic box of 10* 33.
Disk Drive Analyzer ..... 22.
Flip Sort *(holds 75 disks)* ..... 19.

INFORMATION SERVICES

Compuserve
Compuserve Information Service *(includes subscription, manual, 5 hours of connect time, monthly publications)* .... 25.
Executive Information Service ..... 79.
Vidtex Software ..... 59.
Executive Information Service with vidtex 119.

Source Telecomputing
The Source *(subscription & manual)* ... 29.
The Source *with* Sourcelink Software ... 49.

Junior's new look.

Over at Jr. CONNECTION, our consultants are pretty enthusiastic about IBM's relaunch of its not-so-pretty-at-first baby. New keyboard. Expanded memory potential. Admittedly, it's stuff we've been offering from non-IBM sources for months now. But the exciting thing is that IBM's new commitment will translate into a greater variety of hardware and software from third party vendors.

If you own a jr, or are thinking about getting one, our jr. specialists can answer your questions and give you the latest product information. For your PC and XT, keep calling PC CONNECTION. For your PCjr., call Jr. CONNECTION - exclusively for the IBM-PCjr.

1-800/IBM-jr PC

CIRCLE 339 ON READER SERVICE CARD

PC←CONNECTION®

time to call your

Digital Research
Diagnostic Test (PSAT) ..... $14.
OwlCat SAT *(15 hour)* ..... 63.
OwlCat SAT *(60 hour)* ..... 169.
Knoware
Knoware *(requires graphics board)* .... 64.
Spinnaker
Educational Games for Young Computer Users. *(All require graphics board).*
Delta Drawing ..... 34.
Snooper Troops I *(ages 10 to adult)* ... 30.
Snooper Troops II *(ages 10 to adult)* ... 30.
Most Amazing Thing *(ages 10 & up)* ... 27.
Face Maker *(ages 3 to 8)* ..... 23.
Kids on Keys *(ages 3 to 9)* ..... 23.
Story Machine *(ages 5 to 9)* ..... 23.
Fraction Fever *(ages 7 to adult)* ..... 23.
Kinder Comp *(ages 3 to 8)* 20
Rhymes and Riddles *(ages 5 to 9)* ..... 20.
Hey Diddle Diddle *(ages 3 to 10)* ..... 20.
Alphabet Zoo (ages 3 to 8) ..... 20.
Stone *(requires graphics board)*
Great graphics and sound
My Letters,Numbers,Words *(ages 1 to 5)* 29.
Kids Stuff *(ages 3 to 8)* ..... 29.
Across the U.S.A. *(ages 5 & up)* 22

GAMES

Atarisoft
Centipede ..... 29.
Pac Man ..... 29.
Dig Dug ..... 29.
Defender ..... 29.
Stargate ..... 29.
Robotron ..... 29.
Blue Chip
Millionaire ..... 39.
Tycoon ..... 39.
Baron ..... 39.
FriendlySoft
FriendlyWare/PC Arcade ..... 35.
Funtastic
Snack Attack II *(a favorite)* ..... 27.
Cosmic Crusader *(as good as above)* .. 27.
Big Top *(climb to new levels)* ..... 29.
Master Miner *(1 or 2 players)* ..... 29.
Hayden Software
Sargon III ..... 35.
Infocom *High quality text games*
Zork I, Zork II, Zork III ..... *each* 27.
Starcross ..... 27.
the Deadline ..... 27.
Suspended ..... 35.
Witness ..... 35.
Planetfall ..... 35.
Enchanter ..... 35.
Infidel ..... 35.
Sorcerer ..... 35.
Seastalker ..... 27.
Microsoft
Flight Simulator *(new version)* ..... 35.
Origin Systems
Ultima III 39

PC Connection Hardware Special
through November 30, 1984

KOALA TECHNOLOGIES
Speed Key System
- Simplifies the use of Lotus 1-2-3, Wordstar, Dbase II, Multiplan,and others.
- Works like a mouse to move cursor quickly and efficiently, but doesn't monopolize desk space or crowd screen with menus.
- Use or customize preconfigured overlays or create your own to meet individual needs
- REQUIRES. Game port
- INCLUDES: KT 2010 Touch Tablet, software, overlays, manual $109

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for charge cards.
- Your card is not charged until we ship
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- All shipments insured; no additional charge.
- Allow 1 wk for personal & company checks to clear.
- COD max. $1000. Cash or certified check.
- 120 day guarantee on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30. You can call our business offices at 603/446-3383 Monday thru Friday 9:00 to 5:30.

SHIPPING

Continental US: For monitors, printers, and drives, add 2% to all orders. For all other items, add $2 per order for UPS surface, $3 per order for UPS 2nd-Day-Air. We particularly recommend 2nd-Day-Air if you live west of the Mississippi or south of Virginia. In most cases it will only cost $1 more and will save you up to four days on delivery time. **Outside Continental US:** We add freight charges to credit card purchases. For prepayment, call 603/446-3383 for information.

1-800/243-8088

PC Connection 310M
6 Mill St., Marlow, NH 03456
603/446-3383

Orion
J-Bird *(you'll never sleep)* ..... $29.
PC-Man ..... 25.
Paratrooper ..... 25.
Pits & Stones ..... 29.
PCSoftware *(mono or color board)*
Armchair Quarterback ..... 27.
Chess 2001 ..... 27.
Championship Blackjack ..... 23.
Sir-Tech
Wizardry ..... 42.
Sierra/On-Line
Frogger ..... 27.
Crossfire *(keyboard or joystick)* ..... 23.
Ulysses and the Golden Fleece ..... 27.
Spectrum Holobyte
GATO ..... 27.
Sublogic
Night Mission Pinball ..... 29.

HARDWARE

AST Research *(For IBM-PC or XT)*
All AST Boards come with SuperDrive, SuperSpool, and one year warranty.
SixPakPlus 64k upgradeable to 384k, with clock calendar, serial and parallel ports *(game port optional)* ..... 269.
MegaPlus II 64k upgradeable to 256k (or more with MegaPak) with clock calendar and serial port *(parallel, game, or second serial port optional)* ..... 269.
MegaPak 128k *(not upgradeable)* ..... call
MegaPak 256k ..... call
I/O Plus II with clock calendar and serial port *(parallel, game, or second serial port optional)* ..... 129.
Parallel Game or second Serial Port *(for any AST board (specify board)* .. 39.
Connectall *connector bracket (PC only)* 19
AST-5251 ..... 559.
AST-3780 649
MonographPlus with clock calendar, serial & parallel ports ..... 429.
Amdek
Video 300G monitor *(green)* ..... 139.
Video 300A monitor *(amber)* 149
Video 310A monitor *(amber)* ..... 179.
Compucable
Plastic Keyboard & Drive Cover Set 17
IBM Mono Screen Enhancement ..... 17.
Printer to IBM Cable *(specify printer)* ... 32
Smartmodem to IBM Cable ..... 25.
Curtis
STANDS
PC Pedestal *(for IBM Mono or Color)* ... 39.
PGS or Quadchrome Adapter for above 9
Low Profile Tilt and Swivel Pedestal 39
System Stand ..... 21.
CABLES
Extension Cables for IBM Mono Display 39
Keyboard Extension Cable *(3 to 9 feet)* 29.
AC Plug Adapter *(any monitor to your PC)* 8

For the IBM-PC *Exclusively.*

PC CONNECTION®

dBASE III's language is cut from the same cloth as dBASE II's, but they're not the same.

tain a macro expression. Ashton-Tate claims that leaving this capability out of *dBASE III* saves 30 percent in loop execution speed, but macro expressions are unusually powerful in DO-WHILE control statements. Like any other language peculiarity, this hole can be circumvented, but it would unquestionably have been better to leave the language alone and let the programmer pay the execution price if desired.

Ashton-Tate has made too many changes for me to discuss each one of them fully, but I have listed the differences between *dBASE III* commands and functions and those in *dBASE II*. I have also listed the new commands and functions in *dBASE III*.

While the improvements are many, I think Ashton-Tate blew it in one significant area. One of *dBASE II*'s terrible deficiencies is its lack of arrays, either numeric or string. Unfortunately, *dBASE III* doesn't have arrays either. Although some third party programs have addressed this lack in *dBASE II*, most notably the excellent *db!RA*, the lack of any array structure in *dBASE III* is a major flaw.

There are other small changes that any veteran *dBASE II* user would have liked included in *dBASE III* (such as longer variable names), but overall the *dBASE III* language is a real improvement.

Command Comparison

@. .GET—In *dBASE III*, additional CRT format options are available. For new datatype fields, a RANGE clause specifies upper and lower limits on numeric and date entries. A CLEAR clause clears screens below and to the right of a specified location (as in CLEAR EOS).

@. .SAY—In *dBASE III*, a PICTURE clause specifies format instead of the USING clause in *dBASE II*. Additional format options are available.

ACCEPT—In *dBASE III*, the CR (carriage return) response stores null (CHR(0)) to memory variable instead of a space in *dBASE II*.

APPEND—*dBASE III* can handle Memo and Date fields with this command.

BROWSE—In *dBASE II*, an optional command menu allows locking fields at left side of display (like a spreadsheet); editing of a single field; positioning to top, bottom, or specific record; and appending of records to the end of database. This *dBASE III* menu permits faster operation than with *dBASE II* because of *dBASE II*'s keyboard buffering system.

CHANGE—In *dBASE III*, this command uses a more flexible full-screen mode.

CLEAR—The *dBASE II* equivalent of this command, which clears the display screen, is ERASE.

CLEAR ALL—The *dBASE II* equivalent of this command, which closes data, index, and format files and wipes out all memory variables, is CLEAR.

COPY—In *dBASE III*, the STRUCTURE option copies database structure. *dBASE III* has no COPY STRUCTURE EXTENDED command according to the manual, but it worked for me.

CREATE—In *dBASE III*, this command defines field names, lengths, types, and creates database files, but there is no CREATE FROM command or no COPY STRUCTURE EXTENDED command to create a suitable model file.

CREATE REPORT—In *dBASE III*, this report generator's more flexible than the *dBASE II* REPORT FORM command because it uses a menu-assisted, full-screen definition process.

DELETE—In *dBASE III*, the *dBASE II* DELETE FILE command has been officially replaced by the ERASE command, but the old construction still works.

DIR—In *dBASE III*, this command, which displays names of files on a specified disk drive, implements the DOS 2.x PATH command structure. However, the old *dBASE II* syntax, DISPLAY FILES LIKE, can still be used.

DISPLAY—In *dBASE III*, this command can handle Memo and Date fields and displays records a screen at a time, not just 15 records.

DISPLAY MEMORY—In *dBASE III*, this command shows the public or private status of variables and both the display and internal value of numeric variables.

DISPLAY STATUS—The *dBASE III* version of this command provides more information on active database and index files and other system parameters than the *dBASE II* equivalent.

DISPLAY STRUCTURE—The TO PRINT clause in *dBASE III* sends output to the printer.

DO—The *dBASE III* command uses a

WITH clause to pass parameters to the called program and can call a subprogram from an activated Procedure file.

DO WHILE—In *dBASE III*, macro statements cannot be used in a DO-WHILE statement but can be used within the body of a DO-WHILE loop.

EDIT—In *dBASE III*, this command modifies stored data on a full-screen and does not require a record number. It can also handle Memo and Date fields.

ERASE—In *dBASE III*, this command deletes a specified file like its *dBASE II* equivalent DELETE FILE. The *dBASE II* ERASE command clears the screen.

INDEX—In *dBASE III*, this command permits use of Date fields in its index.

INSERT—In *dBASE III*, this command permits use of Memo and Date fields.

JOIN—The *dBASE III* syntax has been modified to use multiple work areas.

LIST—In *dBASE III*, the TO PRINT clause sends output to printer.

MODIFY COMMAND—In *dBASE III*, the built-in full-screen text editor/word processor is more flexible and is better integrated.

MODIFY STRUCTURE—In *dBASE III*, this command does not erase existing data when structure is modified, with certain exceptions.

QUIT—In *dBASE III*, the RUN command replaces *dBASE II*'s QUIT TO option.

READ—*dBASE III* offers no NOUPDATE option.

?—The *dBASE II* equivalent to this command, which displays characters on an output device, is REMARK.

REPLACE—*dBASE III* offers no NOUPDATE option.

REPORT—In *dBASE III*, this command, which displays columnar reports defined with the MODIFY REPORT command, is more flexible.

RESTORE—*dBASE III* provides a much larger pool of memory variables.

RETURN—In *dBASE III*, the TO MASTER clause returns the control to the highest-level calling program.

RUN—the *dBASE II* equivalent to this command, which executes DOS programs from within *dBASE III*, is QUIT TO.

SAVE—*dBASE III* provides an ALL EXCEPT clause in addition to an ALL LIKE clause.

SELECT—*dBASE III* offers ten simultaneously available work areas versus two in *dBASE II*. Alias names can be used in addition to the work area number.

SET XXXX TO—In *dBASE III*, new options for this command include: DECIMALS to set the number of decimal places displayed; DEFAULT to indicate the default disk drive; DELIMITER to indicate how field widths are displayed; DEVICE to indicate where @ commands will be sent; FILTER to filter out records not meeting specified criteria; FIXED to determine whether a fixed number of decimal places will be displayed; FUNCTION to program function keys; HEADING to toggle display of field names with LIST and DISPLAY commands; MARGIN to control the left margin of printed output; MENUS to control display of function key prompts; PATH to specify a search path for file search; PROCEDURE to open a procedure file containing up to 32 subprograms; RELATION INTO to link two independent databases according to a common key; SAFETY to control overwriting of files; and UNIQUE to control handling of records with unique keys.

SORT—The *dBASE III* command can sort on more than one key and is much faster. An undocumented /C option disregards both upper and lowercase.

USE—*dBASE III* provides up to ten work areas; alias and DOS 2.x path names can both be used.

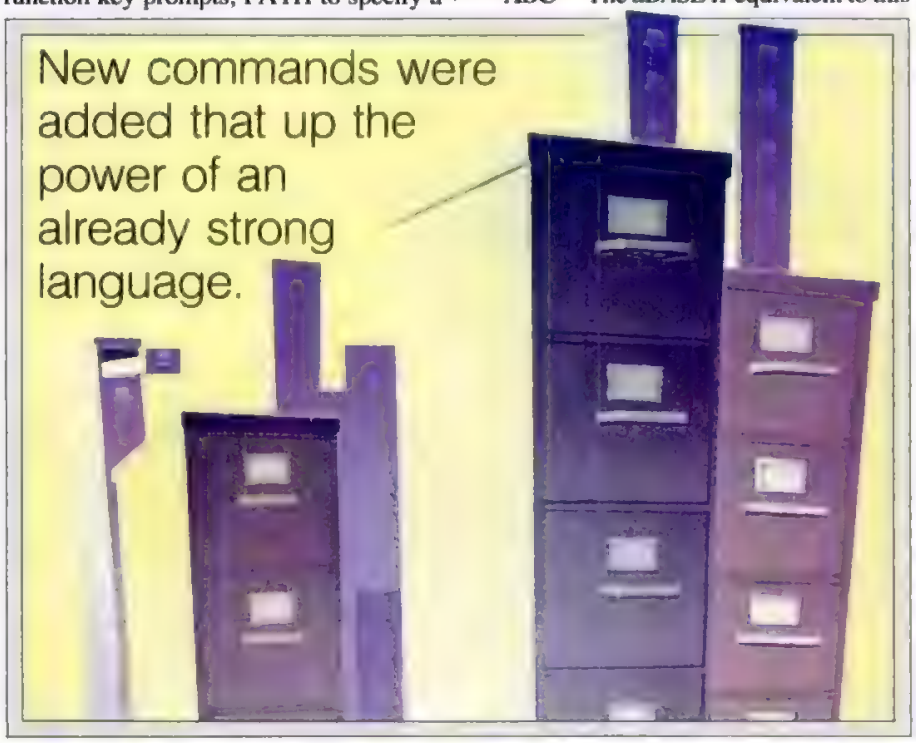
WAIT—In *dBASE III*, when the WAIT command creates a variable, a carriage return response stores a zero instead of a blank space.

ZAP—In *dBASE III*, this command is much faster than the DELETE ALL and PACK commands in *dBASE II* or *III*.

Function Comparison

&—In *dBASE III*, this macro substitution function cannot be used in a conditional part of a DO-WHILE statement.

ASC—The *dBASE II* equivalent to this



function, which returns the ASCII code value of the first character in a string, is the RANK function.

DATE—In *dBASE III*, this function gets the system date from DOS.

DELETED—the *dBASE II* equivalent to this function, which identifies records that have been marked for deletion, is the * function.

EOF ( )—The *dBASE II* equivalent of this function is EOF.

RECNO—The *dBASE II* equivalent to this function, which returns the current record number, is the # function.

SUBSTR—The *dBASE II* equivalent, which extracts a specified part of a character string, is the $ function.

UPPER—The *dBASE II* equivalent, which converts lowercase characters to uppercase, is the ! function.

New Commands

The following *dBASE III* commands and functions have no equivalent in *dBASE II*.

ASSIST—A menu-driven operation aid designed for interactive commands by beginners.

AVERAGE—Computes arithmetic mean of expressions for all or some of the records in the active database.

CLOSE—Closes specified files. It can close database, alternate, format, index, and procedure files. It does not affect memory variables.

COPY FILE—Copies any type of file.

CREATE LABEL—Creates or modifies a label format file. This command is identical to MODIFY LABEL in *dBASE III*.

EXIT—Exits from a DO loop and continues with the next statement after the loop.

LABEL—Prints labels using a predefined label form file.

LOG—Returns the natural logarithm of a number.

MODIFY LABEL—Creates or modifies a label form using a full-screen definition process.

MODIFY REPORT—Creates or modifies a report form. This *dBASE III* report generator is more flexible than the one in *dBASE II* and uses a menu-assisted, full-screen definition process.

PARAMETERS—Assigns local memory variables names to data items that are passed from a calling program with a DO-WITH statement.

PRIVATE—Hides variable definitions from called (lower-level) programs. It is similar to local variables in other high-level languages.

PROCEDURE—Identifies the beginning of each subprogram in a procedure file (which is invoked with the SET PROCEDURE TO command).

PUBLIC—Declares a memory variable as available to all called programs, much like the global concept in other high-level languages. It is not released by the autoreleasing mechanism at program termination.

SEEK—Positions pointer to the first record with an index key that matches a specified expression, similar to FIND.

TYPE—Displays or prints the contents of a text file.

New Functions

BOF—Indicates the beginning of a database file.

CDOW—Character day-of-the-week function that returns a character string containing the day of the week when given the day number.

CMONTH—A character month function that returns the character name of any month when given that month's number.

COL—Returns the current column position of the screen cursor.

CTOD—Converts a character string date to an internal date variable.

DAY—Returns the numeric value of the day of the month from a date variable.

DOW—Returns a number corresponding to the day of the week (Sunday = 1).

DTOC—Converts a date variable to a character string variable.

EXP—An exponential function that returns *e* to the xth power.

LOWER—Converts uppercase characters to lowercase.

MONTH—Returns a number representing the month from a date variable.

PCOL—Returns the current column position of the printer.

PROW—Returns the current row position of the printer.

ROUND—Rounds numbers to a specified number of decimal places.

ROW—Returns the current row location of the screen cursor.

SPACE—Creates a character string containing a specified number of blanks.

SQRT—Returns square root of a positive number.

TIME—Returns the system time as a character string.

YEAR—Returns the complete numeric value of the year from a date variable.

Documentation

Ashton-Tate has clearly expended a lot of effort improving the documentation for *dBASE III*. The new manual is beautifully written and nicely typeset. Screen output is shown in green insert boxes, which is a good way of showing what the program will produce without cluttering up the manual with pseudo-screen images. The manual has an excellent table of contents, index, and tabs for easy reference. An extended sample accounting suite is in the manual and on disk.

The *dBASE II* manuals have always had difficulty reconciling the different needs of beginners and advanced users and programmers. While the *dBASE III* manual still includes a tutorial for beginners and reference sections for the more sophisticated, the entire manual is appropriately written for both of these audiences—the simpler sections don't talk down to you and are informative even for the advanced, while the reference sections

Teleservice Telesupport

Micro Flash is Reliable

- In our 4th year of business *(One of the Originals!)*
- Positive buying power within the industry meaning well-stocked inventories and a consistent supply
- A reputation as specialists in the business and corporate marketplaces
- A dedicated approach to honest customer service

Micro Flash Guarantee

- We sell the latest versions
- We support what we sell
  We won't tell you to call the publisher or manufacturer for after-sale support.
  We want you to call us!
- We won't sell you anything we don't think you need
- If the product is defective when you receive it—we'll replace it!

Micro Flash Terms

- MasterCard or VISA—with no credit card surcharge added
- Mail Orders accompanied by certified or cashier's checks
- Call our Credit Manager for information on institutional purchase orders
- All returns must have a Return Authorization Number
- $100.00 minimum order
- Products and prices subject to change without notice
- Corporate Discounts

Micro Flash Shipping

- $8.00 for UPS surface (except for printers and monitors)
- Add $3.00 per item for UPS 2nd Day Air
- All shipments fully insured at no extra charge
- Call for information on foreign orders, US Mail, CODs
- Overnight delivery service available

PRODUCTS FOR IBM PC & COMPATIBLES

HARDWARE & PERIPHERALS	RETAIL PRICE	MICRO FLASH
Alloy PC + Hard Disk/Tape BU	$4295.00	$3600.00
AST Research SixPakPlus 64K	395.00	269.00
AST MonoGraph Plus (Lotus Compatible)	595.00	495.00
64K Ram Chip Sets "$1 per K"	100.00	55.00
CDC 9409 DS/DD Disk Drive	525.00	195.00
Davong 10 MB External	2395.00	1795.00
Hauppauge Intel 8087 Chip	175.00	157.00
Hayes Smartmodem 1200	699.00	489.00
Hercules Graphics Card	499.00	389.00
Microsoft® Serial Mouse	195.00	139.00
Plantronics Color Plus (Symphony Compatible)	560.00	389.00
Printers—Epson, Oki, Diablo, NEC, Toshiba, Brother, Others		$CALL$
Princeton Graphics		
Max-12 Amber Monitor	249.00	189.00
HX-12 Hi-res RGB Monitor	695.00	524.00
SR-12 Super Hi-res RGB Monitor w/Scan Doubler	1048.00	843.00
PTI Datashield Power Supply	359.00	329.00
Diskettes—3M, Dysan, Others		$CALL$
SOFTWARE		
Ashton-Tate dBase III	$ 695.00	$ 449.00
FRAMEWORK	695.00	489.00
BPI Systems Accounting* ea.	595.00	398.00
CYMA Shoebox Acctg Pkg	395.00	315.00
Human Edge Sales Edge	250.00	198.00
Microrim Inc. R:base 4000	495.00	315.00
Microsoft® Multiplan™*	195.00	139.00
Multi Tool™ Word	375.00	249.00
Multi-Tool™ Word with Mouse	475.00	298.00
Multi-Tool™ Cash Plan	125.00	94.00
Basic Compiler*	395.00	276.00
Business Basic Compiler	600.00	418.00
C Compiler	500.00	349.00
Pascal Compiler	300.00	224.00
Fortran Compiler*	350.00	244.00
Cobol Compiler*	700.00	518.00
Sort Facility*	195.00	148.00
Macro Assembler	100.00	74.00
Project	250.00	198.00
Microstuf Crosstalk XVI	195.00	119.00
MultiMate Word Processor	495.00	279.00
Peter Norton Utilities	80.00	55.00
RoseSoft ProKey	129.95	95.00

*Also available in Apple IIc Format

PRODUCTS FOR APPLE MACINTOSH

Davong MacDisk 10 MB	$2395.00	$2059.00
Haba Systems Habadex	200.00	159.00
Memorex 3½" Diskettes	69.95	49.00
Microsoft® Multiplan™	195.00	148.00
Basic Interpreter	150.00	122.00
Chart™	125.00	99.00
Multi Tool™ Word	195.00	148.00
Odesta Helix	395.00	299.00
PFS File & Report	195.00	149.00

Many other products available at comparable discounts! Quantity pricing available

For product information, price quotes, technical support please call

415/680-1157

inside California 800/457-2433

To order from outside California, call

800/458-2433

Telex # 353199 MFLASH UD

MICRO Flash

COMPUTER SYSTEMS, INC.

1110 Burnett Avenue, Suites J & K
Concord, CA 94520
Member: Better Business Bureau, Chamber of Commer
Listed: Dun & Bradstreet

CIRCLE 315 ON READER SERVICE CARD

are quite clear and easy to grasp. A helpful ringbound *Quick Reference Chart* is also included.

Conversion

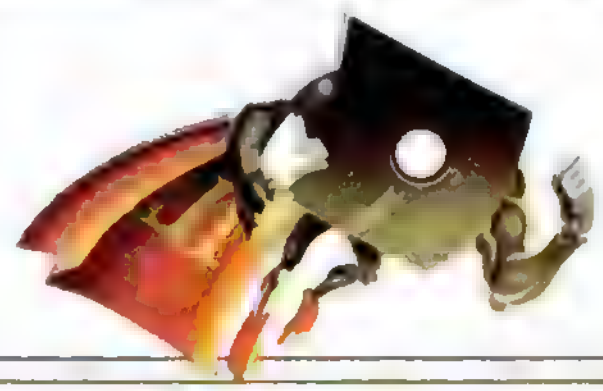
The tremendous speed advantages of *dBASE III* alone make it a much more desirable environment than *dBASE II* for complex systems. With all the syntax changes, new commands, and deleted commands, is the process of converting existing programs from *dBASE II* to *dBASE III* a big job?

The answer is a resounding "It depends." Ashton-Tate has included a conversion tool called *dCONVERT* that can automate much, but not all, of the conversion process to *dBASE III*. Its ability to handle the conversion depends on many factors, including how straightforward the *dBASE III* program is, the programming techniques and styles used, *dBASE III*'s quirks, and more.

A nicely written guide to *dCONVERT* by Adam Green, a well-known *dBASE* trainer, is also included. It discusses the differences between *II* and *III* (the main manual doesn't even mention *dBASE II;* Ashton-Tate is serious about considering *dBASE III* a separate product rather than an upgrade of *II*) and includes useful suggestions on using the new capabilities and style of *dBASE III*. The guide also indicates the situations in which *dCONVERT* can manage a translation automatically and those in which you will have to step in manually.

dCONVERT handles many of the simple syntax changes automatically. For example, EOF() is inserted for EOF, DELETED() for *, and so on. Even some of these simple conversions can be troublesome; *dCONVERT* will change # to RECNO(), which is usually right, but if you used # as a "not equals" symbol, an error will result.

More troublesome are logic changes dictated by the way *dBASE III* works. Several significant changes require recoding a *dBASE II* program into *dBASE III*. For example, when a FIND command is unsuccessful, *dBASE II* sets the current record number to 0; the *dBASE II* test for a NO FIND command is then IF # = 0. In *dBASE III*, however, a NO FIND command sets the RECNO() pointer to the bottom of the file and sets the EOF() flag. Another example is the way *dBASE III* treats carriage returns as input to ACCEPT or WAIT statements. *dBASE III* treats such input as a null, or zero length, string, while *dBASE II* assigns a single blank to a carriage return response. The code changes necessary to handle this difference are not major, but *dCONVERT* can't do it for you.



> With all the syntax changes, new commands, and deleted commands, is converting existing programs from dBASE II to dBASE III a big job? The answer is a resounding "It depends."

The new automatic scoping provisions of *dBASE III* can lead to many problems to which *dCONVERT* is oblivious. The parameter-passing ability and PUBLIC and PRIVATE statements are real advances in allowing modular program development without side effects, but they can lead to some nasty surprises when converting *dBASE II* program systems. It is not particularly difficult to recode the necessary statements, but it is cumbersome and time consuming.

dCONVERT can be run directly from DOS, in which case "wild card" symbols can be used to convert an entire batch of files. The program indicates its progress by displaying dots as blocks of code are converted—a considerate touch—and displays when programmer conversion will be required. Unfortunately, this assessment is made from *dCONVERT*'s point of view, so programs that *dCONVERT* says are "100 percent converted" will often need either a little or a lot of additional manual conversion.

The converted program includes comment lines, beginning with *!!, that tell you what *dCONVERT* has done. This provision is also sometimes inconsistent; *dCONVERT* changes some things without any message.

dCONVERT also converts DBF, FMT, MEM, and other files. Data files must be converted because *dBASE III*'s header is larger (to accommodate the greater number of fields, added data types, and so on), and the form of MEM files and NDX files is different as well. *dCONVERT* doesn't actually convert NDX files, but it produces a one-line program file that you run under *dBASE III* to produce a new index.

To investigate the difficulty of converting from *dBASE II* to *dBASE III*, I first converted a reasonably simple database system, prepared for an engineering client, that stored information on plot locations. This program system included eight separate program modules and was written in reasonably standard *dBASE II* (no arcane constructions or tricks). The data file contained about 1,000 records.

The conversion proceeded smoothly and quickly. *dCONVERT* reported that all the modules were translated with no programmer conversion required. When I ran

Baby Blue II

Multifunction/Multiprocessing

*The **INTELLIGENT** Choice*

Packed with ALL the popular features:

- Up to a **256 Kilobyte Memory Expansion**, optional in 64K blocks.
- **Clock/Calendar** with long-life battery back-up (choose replaceable or optional rechargeable battery).
- **Parallel Port** for use with IBM/Epson and most other parallel printers (addressable as LPT1: or LPT2:)
- **Two (2) Serial Ports** addressable as COM1: and COM2:, OR use our unique extended port addressing to configure for serial devices other than COM1: and COM2: (i.e. pointing devices, graphics tablets, etc.)
- **Baby Blue II** is fully compatible with the IBM PC, the PC/XT and other compatibles, including the Texas Instruments Professional Computer.

Not just another DUMB multi-function board.

With all that hardware to manage, we think a board should have a brain. You won't find this feature on other boards – they may look pretty, but they can be pretty boring once you get them home. Baby Blue II is actually a second computer inside your PC, built around the high-speed Z-80B microprocessor.

- **Background Processing:**
  Compile, assemble, sort, calculate, communicate or print – all in the background, while you and your PC continue to work on other tasks in the foreground. Because it is a separate computer, Baby Blue II performs these functions without slowing down your PC, helping you to do more work in less time.
- **Autostart at Preset Time:**
  Baby Blue II can begin any task, even a background operation, at a specific time by consulting the on-board real-time clock.
- **CP/M Capability:**
  Baby Blue II offers instant access to the vast CP/M-80 library of mature, professional software for every conceivable application.
- **Dual Ported Memory and I/O:**
  You can use Baby Blue II's memory, ports and clock as ordinary enhancements to your PC. Or, you can let our Z-80 micro-processor control the board directly, for truly independent back-ground operation.

All this and SOFTWARE too . . .

Systems utilities

PDQ RAMdisk Software: create a FAST pseudo-disk drive of any size in available system RAM. The DOS 2.0 version lets you change the size of your RAMdisk from the keyboard.

Print Buffer/Spooler: a TRUE print spooler: the Z-80 buffers and manages printing independent of your PC. Unlike other so-called "spoolers", this one won't stop your printer or slow you down when you start another job.

Clock Software: sets Baby Blue II's clock and initializes the system clock at boot time – never type the time and date again!

Communications

Smart Terminal Emulator Package (STEP): talk to other microcomputers or connect to larger host computers, as an asynchronous terminal through Baby Blue II's serial ports. Unlike other "smart terminal" programs, STEP offers full emulation of popular video display terminals (the standard package includes Televideo 950 and Hazeltine 1500.
IBM 3101, DEC VT100 and many others are optionally available). You can send or receive text files, and with STEP's unique Sessions Menu, changing your configuration is a keystroke away.

BSTAM File Transfer Utility: Transmit and Receive text, HEX, and binary files (including .COM files) without errors and without fuss. BSTAM is easy to use, with all configuration parameters handled transparently under STEP.

CP/M-80 compatibility

Baby Blue Conversion Software: Microlog's famous CP/M Emulator turns CP/M-80 programs into PC-DOS programs for fast, efficient execution on Baby Blue II. Completely transparent operation using standard PC-DOS commands – freely mix PC-DOS with CP/M programs and text/data files on the same PC-DOS disks.

Convert: supports bidirectional file transfer between PC-DOS and popular CP/M disk formats.

Keyfix: automates your keyboard with 54 programmable function keys for CP/M programs, eliminating tedious typing chores (max. 80 characters per key).

Baby Blue II (64K installed) . . . . . $ 695.

QUALITY you can count on . . .

Microlog is in the business of producing high quality, intelligent computer peripherals. Extensive factory testing gives our products one of the highest reliability rates in the industry. The finest components, connectors, and multi-layer PC board design, ensure years of trouble-free operation. We back all our products with a 90 day warranty and full technical support.

For more information on Baby Blue II and other fine Microlog products, see your microcomputer dealer or contact us:

Microlog™
A TU INTERNATIONAL COMPANY

Microlog, Inc.
222 Rte. 59
Suffern, NY 10901
(914) 368-0353

CIRCLE 516 ON READER SERVICE CARD

Baby Blue II is a trademark of Microlog, Inc.
CP/M is a registered trademark of Digital Research, Inc.
BSTAM is a trademark of Byrom Software, Inc.
IBM is a trademark of you know who.
©1983 Microlog, Inc.

the converted *dBASE III* system, everything worked until the program executed some subprograms. *dBASE III*'s automatic release of memory variables repeatedly stopped the program, because variables that had been created in the subprograms and that were subsequently used in a higher-level module no longer existed.

Fixing this problem took only a few minutes. The fix can be "patched" in by declaring the culprits as public before they are initialized. A better method is to declare all such variables that are needed throughout the system as public in the highest level module.

> Ashton-Tate has included a conversion tool called dCONVERT that can automate much, but not all, of the conversion process.

All in all, converting this system to *dBASE III* took less than an hour and was almost painless. The *dBASE III* version ran faster than the old version, particularly when sorting or, to a lesser extent, indexing was required. The conversion was definitely worth the limited amount of time required.

Next I decided to take on a more ambitious task. I converted a complex customized mailing list management system prepared for another client. The *dBASE II* version was over 3,600 lines of code in 22 program files and occupied over 100K of program storage. I had used many advanced techniques and tricks to make it both flexible and easy to operate.

dCONVERT itself took less than a half hour to convert the entire program, as well as the format and data files. As with the simpler package, it then reported that all the programs were converted 100 percent. As I expected, this statement did not turn out to be true. Many of the trickier constructions had to be modified manually, but the task ultimately turned out to be rather straightforward. The more I worked with *dBASE III*, the easier the process became. After only a short while, I began to modify sections of the code that were able to work under *dBASE III* but that could be made more logical or efficient with the new system.

Interestingly, some *dBASE II* constructions that, according to the manual, should not work under *dBASE III* were not translated by *dCONVERT* and, in fact, worked as they did under *dBASE II*. For example, the statement DISPLAY FILES LIKE *.NDX should be changed to DIR *.NDX, but the old statement worked as expected anyway. Even more surprisingly, a few compound statements with macro expansions in a DO-WHILE loop seemed to work as expected. A note in the *dBASE III* manual takes great pains to explain that macros can not be used in *dBASE III* control statements because they would slow down the system by up to 30 percent. Some research revealed that my logic was faulty; the macro portion of the compound DO statement was not needed for correct operation.

Nonetheless, *dCONVERT* does not flag macros in DO-WHILE statements; it continues to report 100 percent conversion with no alterations necessary. This result is clearly wrong, but the problem in *dCONVERT* should not be hard to correct.

The balance of the conversion involved exactly the kinds of logic changes covered by Green in his explanation. None was terribly complex and the entire system was modified in less than one long work day, even with revisions and enhancements to program operation that occurred to me as I waded through the program files. The system ran noticeably faster and more smoothly under *dBASE III*. I am not sure this particular client would quickly recoup the cost of conversion if it were paying my normal rates for such work, but other systems I have written—that do sorting, work around *dBASE II*'s field limitations through complex tricks, or would run better with more than two files open at once—would benefit more. The added speed (and reduced delays) of *dBASE III* would probably result in cost reductions that would clearly justify the conversion expense.

Summary

As lengthy as this evaluation has been, it still hasn't been able to delve fully into *dBASE III*. Like its predecessor, *dBASE III* is a big, complex program that has tremendous flexibility and power. It takes a significant investment to learn its intricacies, but it can be used quickly and relatively painlessly even by novices.

While *dBASE III* is far from perfect, it is unquestionably far better than its predecessor *dBASE II*. The price differential between the *II* and *III* versions for the PC is minor given the cost of learning the system and the dividends *dBASE III*'s faster execution will pay.

When bombarded with publicity extolling the virtues of such integrated software systems as Lotus's *Symphony* and Ashton-Tate's own *Framework*, you should remember that the database capabilities built in to these integrated packages is very limited indeed. You'll need the power of *dBASE III* if you must do any serious data management. *dBASE III* represents an honest advance in the microcomputer database management state-of-the-art at a very reasonable price. ■

> Like its predecessor, dBASE III is a big, complex program with enormous power that can be used relatively painlessly.

AND NOW THE GAME BEGINS

INTRODUCING THE AT&T

PERSONAL COMPUTER.

The personal computer game is ready for business—and now it's your move. To win the game your company needs a fast, flexible, reliable personal computer that enables you to call the shots.

Go directly to the new AT&T Personal Computer.

The AT&T Personal Computer is more than just a superior piece of hardware. Behind it is a commitment to a better way of managing information and communications. One that can pay off handsomely in increased productivity and profits.

Because our AT&T PC is designed to be flexible enough to meet all your business needs—today and in the future.

Whether you use it as a stand-alone workstation or as a team player in a fully integrated system, you'll find our PC a high-performance machine. And a hard-working addition to your office.

Its fast processing and high-resolution graphics will help make any computer task a computing pleasure. In addition, you can expect more standard features. More expansion slots. More options for future growth.

OFF-THE-SHELF SOFTWARE DOES THE JOB

Driven by the MS-DOS* operating system, the AT&T PC runs the most popular off-the-shelf software for a wide range of business applications. Financial analysis. Forecasting. Budgeting. Word processing. Inventory. The AT&T PC does it all.

And its flexibility means that when it's time to expand, our PC will actually make your computer growing pains painless.

With our unique PC Interface it can be linked to the more sophisticated, higher capacity world of the UNIX** System V Operating System—the AT&T Computer "brain" that is emerging as the operating system standard for multi-user, multi-tasking machines.

THE AT&T TRADITION CONTINUES

Some things about our PC cannot be measured in bits and bytes, but are of immeasurable value.

For instance, the unmatched service and support of AT&T. The built-in reliability—and outstanding quality—of our products. The century-long tradition of technological innovation and personal attention to detail.

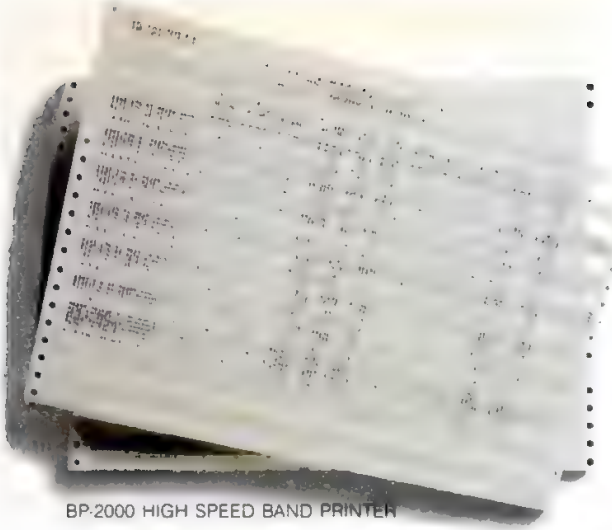
Think about it. Then make your move—to the AT&T Personal Computer, from AT&T Information Systems.

To get in on the game, call your AT&T Account Executive, visit an Authorized AT&T PC Dealer, or call 1 800 247-1212.

AT&T INFORMATION SYSTEMS. WHEN YOU'VE GOT TO BE RIGHT.

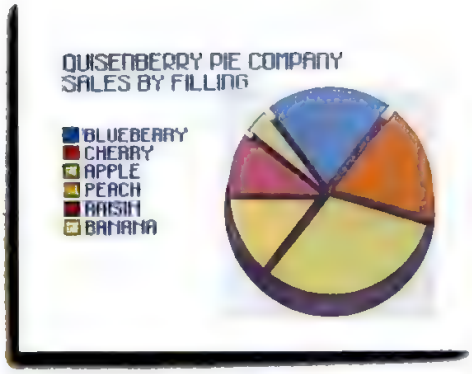
AT&T

*MS-DOS is a trademark of Microsoft Corporation.
**UNIX is a trademark of AT&T Bell Laboratories.
©1984 AT&T Information Systems



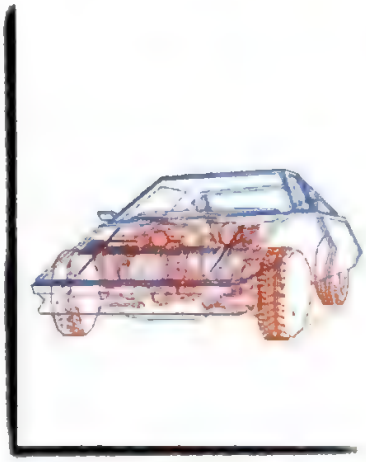
BP-2000 HIGH SPEED BAND PRINTER

M-100L
MATRIX PRNTER

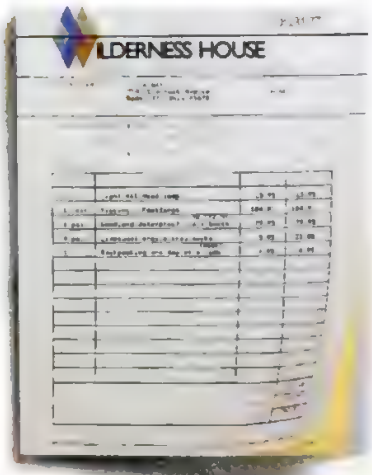


8070 MATRIX PRINTER

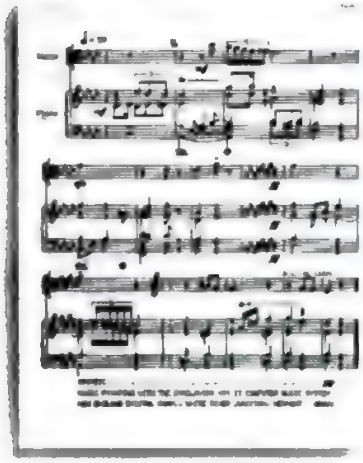
DP-35 DAISYWHEEL PRINTER



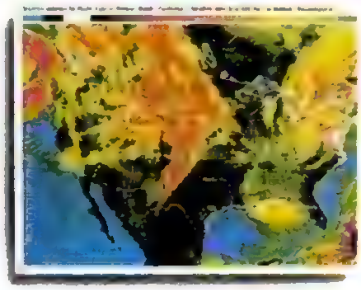
8050 MATRIX PRINTER



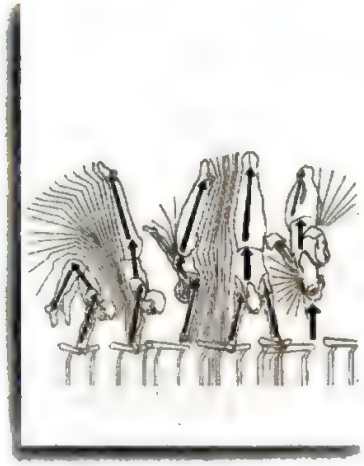
M-200 MATRIX PRINTER



8010 MATRIX PRINTER

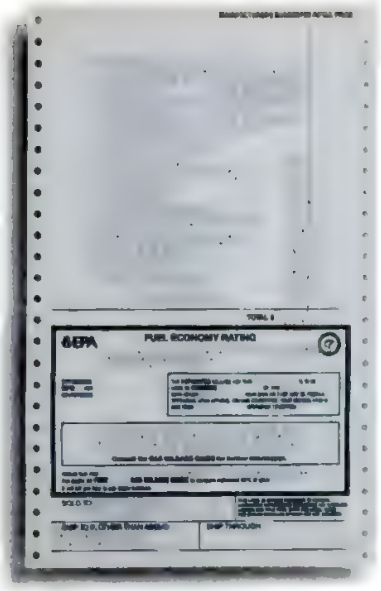


8070 MATRIX PRINTER

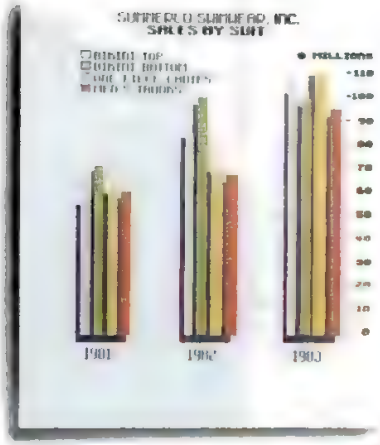


8020 MATRIX PRINTER

Dataproducts printers.
Nobody puts ideas on paper so many ways.

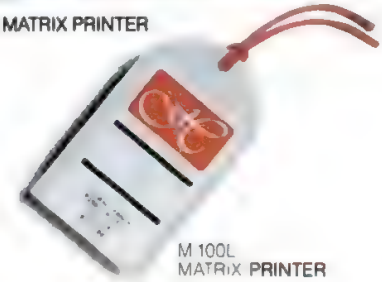


B-1000
MEDIUM SPEED BAND PRINTER

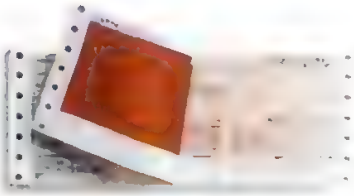


8050 MATRIX PRINTER

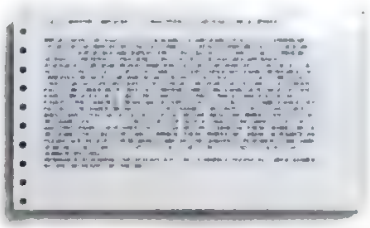
B-600 MEDIUM SPEED BAND PRINTER



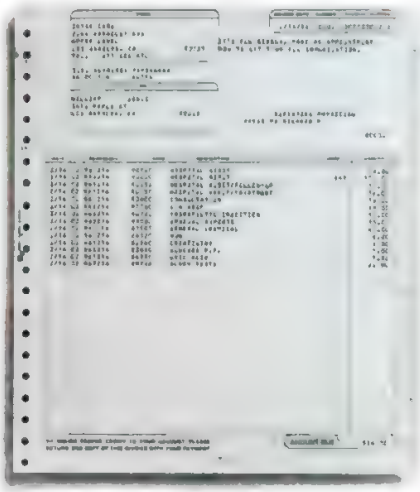
M 100L
MATRIX PRINTER



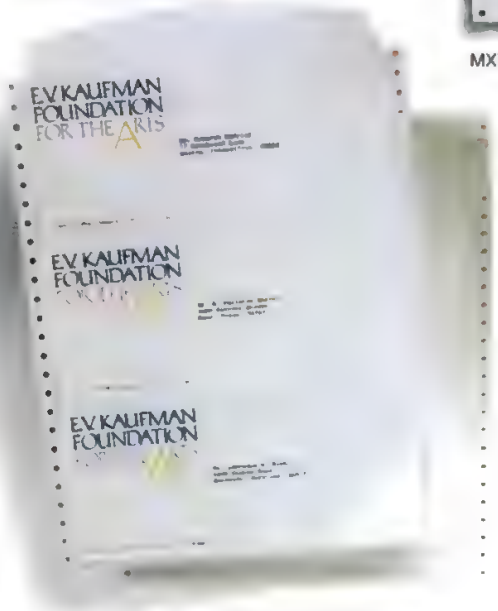
M-120 MATRIX PRINTER



MXT-1200 MILITARY PRINTER



B-300 MEDIUM SPEED PRINTER



DP-55 DAISYWHEEL PRINTER

8050 MATRIX PRINTER

DP-55 DAISYWHEEL PRINTER

...and so on.

CIRCLE 153 ON READER SERVICE CARD

DATAPRODUCTS CORP., 6200 CANOGA AVE., WOODLAND HILLS, CA 91365. (818) 887-3924 IN EUROPE, 136-138 HIGH ST., EGHAM, SURREY, TW 20 9HL ENGLAND.

YOU ARE UNBEATABLE

WITH THE CYBERNETICS TWINS!!

...RM/COBOL[1] and CRT![2]. The combination provides a uniquely powerful set of business software tools.

RM/COBOL IS THE MOST WIDELY-USED MICROCOMPUTER COBOL...and for good reason. Highly compatible across the widest range of micro/mini/mainframe computers, it is the language of choice for serious business applications. With the release of **RM/COBOL** for the IBM mainframe machines (370, 30xx, 43xx), it is now possible to have compatibility over a truly huge range of computing power...**from micros to mainframes.**

CRT! from Cybernetics (COBOL Reprogramming Tool!) is a source program generator for **RM/COBOL** that can automatically produce a wide range of file maintenance, report printing, and other types of **RM/COBOL** source programs. Programs produced by **CRT!** provide a flexible alternative to many "database" software packages, since generated source programs may be modified for special requirements if desired. All source programs produced by **CRT!** are, of course, the property of the **user** of **CRT!**

In addition to the Cybernetics twins, **RM/COBOL** and **CRT!**, we offer source program licenses for the most comprehensive microcomputer business applications...the MBSI Realworld[3] software written in **RM/COBOL**. Starting life as the minicomputer-based MCBA[9] business applications, this software brings a new degree of professionalism to microcomputer applications.

Our software is available and supported for a wide range of microcomputer operating systems including CP/M,[4] CP/M-86[4], MP/M[4], MP/M-86[4], PCDOS, MSDOS[5], OASIS[6], TRSDOS[7], UNIX[8], and RM/COS[1]. Contact us for details.

CALL NOW.
(714) 848-1922

Trademarks of:
1 - Ryan-McFarland Corp
2 - Cybernetics, Inc
3 - Micro Business Software, Inc.
4 - Digital Research Inc.
5 - Microsoft, Inc
6 - Phase One Systems, Inc.
7 - Tandy Corp
8 - Bell Telephone Laboratories
9 - Mini Computer Business Applications, Inc.

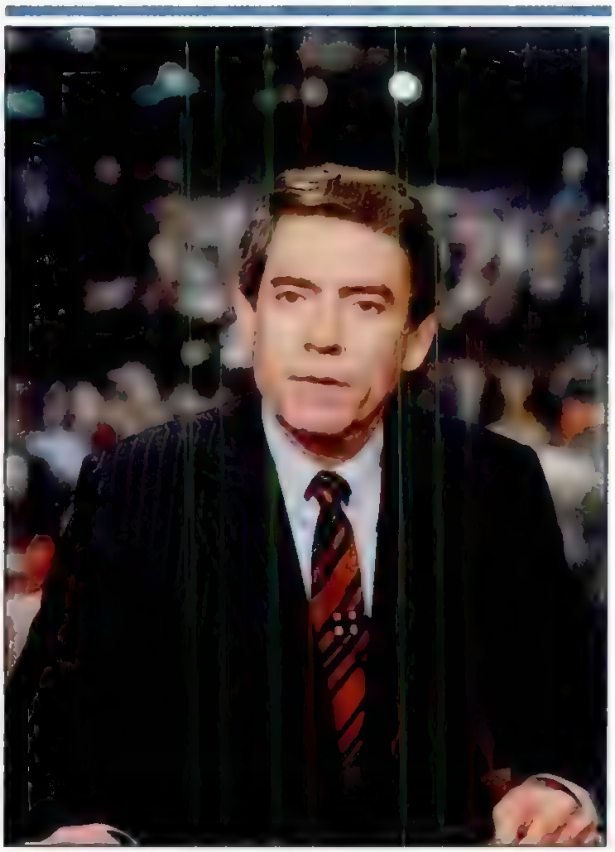
available for:

IBM TEXAS INSTRUMENTS NEC
TELEVIDEO HEWLETT-PACKARD DELTA
DIGITAL EQUIPMENT CORPORATION TOSHIBA
EPSON HEATH ONYX NORTHSTAR IMS
XEROX RADIO SHACK COMMODORE SPERRY UNIVAC
SHARP SANYO OLIVETTI APPLE CORVUS
CINTEL CALIFORNIA COMPUTER SYSTEMS COMPAQ COMPAC
[illegible]

CYBERNETICS INC

8041 Newman Avenue
Suite 208
Huntington Beach, CA 92647
(714) 848-1922

© Copyright 1983 by Cybernetics, Inc. all rights reserved.



CBS Makes News with PCs

Four PCs in Dallas gave Dan Rather's memory a boost during the Republican Convention. Tied to computers in New York, they helped the network's correspondents get information instantly.

The canned hysteria of the Republican convention in Dallas last summer was a journalist's headache. At the Democratic powwow in San Francisco, Geraldine Ferraro gave the news hounds plenty of copy to file. But in Dallas, the reporters were aching for stories.

The CBS correspondents stationed in the network's three-tier election headquarters on the convention floor at first glance seemed no better off than the reporters who flashed as many press badges as there were Reagan for President buttons and American flags. Along with the two other major networks, though, CBS had an edge. A news source kept them up-to-date on developments with the delegates. In fact, it helped them generate enough story ideas to enliven their nightly coverage of this drab political affair.

The source of all this information was stored behind the slick, blue CBS tower, in an inconspicuous white trailer. There, four IBM PCs, tied to CBS mainframe and minicomputers in New York, offered access to over 12 years of political files and

a comprehensive database covering all the delegates on the GOP convention floor. The seven-person research staff at the PC keyboards generated enough story ideas and accessed enough data to keep Dan Rather spouting facts about the delegates, the candidates, and the Grand Old Party. To viewers, Rather seemed to have either the memory of an elephant or a mile-long cue card.

In fact, during the convention's opening ceremony, a CBS correspondent asked one of the researchers about the delegate mix. The researcher punched out the story at the IBM PC keyboard, even though the PC's disk drive held no software. A box of *DisplayWrite 2*, along with Lotus's *1-2-3* and several boxes of the language processor STSC APL*PLUS/PC, sat on the nearby desktop. The word processor he was using was contained in the research unit's DEC PDP-11 mini at its New York headquarters. His story automatically became part of the CBS News delegate database.

Mainframe Access

At one point in the story he needed some details on the percentage of delegates who were white males. He passed the request to Richard Silverman, deputy director of the election and survey unit of CBS News. Using the APL*PLUS/PC software package, the appropriate keycap labels, and a Hayes 1200B modem, Silverman accessed the New York IBM 370 mainframe in minutes. This mainframe, which also handles all corporate accounting work for CBS, held the results of the CBS News survey of the 2,235 Republican delegates who were raising hell in the Dallas convention hall. The requested information immediately appeared on screen: 51 percent of the Republican delegates were white males. Silverman passed it on to the writer, who punched out the rest of his story.

With the corporate mainframe on-line, Silverman then demonstrated how the database management, analysis, and communications program he had constructed with APL could tap into the CBS data center mainframe from 1,500 miles away. With the information it accessed, CBS News could generate dozens of story ideas for the anchor desk. The anchors in turn could offer their on-the-spot analyses based on solid data, like that from the CBS News survey.

Within minutes, CBS found that 45 percent of the delegates had annual incomes in excess of $50,000.

From this survey, the staff researcher at the PC had also learned that four delegates were planning to withhold their votes from the Reagan/Bush ticket. The researcher passed on the names of those delegate-anomolies to a correspondent covering the floor. The news-starved reporter had been hungry for just that kind of substantial lead.

Earlier that summer at the Democratic convention in San Francisco, a similar search of the research unit's 1976 delegate survey discovered that one delegate had then voted for Mondale for president. CBS immediately contacted the delegate for a follow-up interview to see if he had changed his mind. (He hadn't.)

When the research staff was not retrieving information in Dallas and San Francisco, they toured the convention floors with Radio Shack Model 100s, updating the 2-week-old data on the delegates from the CBS News survey. They would then transmit it to the New York database.

Silverman was able to tabulate the delegate information his staff had collected in any way he might desire. Within minutes of one query made in Dallas, he found that 45 percent of the Republican delegates had annual incomes in excess of $50,000.

The APL*PLUS/PC software the staff used to cover the conventions was the same they use for their ongoing opinion polling and analyses, conducted in conjunction with the *New York Times*. "Our political researchers are working all year round just keying in information, writing reports, creating handbooks, and answering questions," Silverman said. "We just don't come out of the woodwork at election time."

The CBS corporate mainframe accesses surveys that the CBS News research unit has been conducting since 1972. But 1984 was the first election year that CBS replaced its "dumb" terminals with IBM PCs at the convention sites, eliminating the costly leased phone lines between the conventions and New York. "At CBS there is a growing acceptance that you can't cover an event of this complexity accurately without computers," Silverman, a 14-year CBS veteran, explains. "I have been at CBS long enough to see people's attitudes change from 'things were better in the old days' to a real acceptance that 'if we didn't have computers, we wouldn't have as good a broadcast.' "

The configurations of the four IBM PCs that Silverman had installed in the research unit trailer in Dallas all included green monochrome screens and 512K of memory. Each was attached to an IBM graphics printer; one NEC 3550 letter quality printer was on hand for correspondence. And although seven PCs had been on the floor of the Democratic convention at San Francisco's Moscone Center, the four machines in Dallas were able to handle the same basic tasks.

In addition to the mainframe-based delegate survey, the general CBS News political database was a prime source of convention trivia and information for broadcast. This database is on the research unit's New York DEC mini.

When Geraldine Ferraro's name was placed into nomination for vice-president at the Democratic gathering, reporters from all corners of the convention hall dashed madly to gather details about her

TRANSEND
PC
ComPlete

99¢ Software is here!

AND IT'S AS EASY TO USE AS IT IS TO PAY FOR

INTRODUCING Transend PC ComPlete

Here it is! The first complete and integrated communications software. It's easy to use and has more bells and whistles than we can list. So we've developed a TRIAL-SIZE package that allows you to experience Transend's unique design and awesome power for 15 phone calls. ComPlete. For less than a buck!

And It's Integrated

Transend PC ComPlete's ability to automatically access information and electronic mail services, and to send and receive MS/DOS files with verification are features you would expect, but what you wouldn't expect are:

- Zoom-in windows
- Built-in Letter Writer...Word processor
- Unattended electronic mail
- Automatic Learn mode that teaches your computer to think
- Instant "peek" at a file
- 99¢ trial-size package with all functions operational.

User defined function keys allow you to perform complicated on-line tasks with the touch of a key, saving you valuable on-line time (and money!).

And A Surprise Offer

Each TRIAL-SIZE box contains a surprise gift worth $10.00...and if that's not throwing our shirt in, we'll even give you the buck back when you trade-in your TRIAL-SIZE for the FULL-SIZE Transend PC ComPlete with unlimited calls.

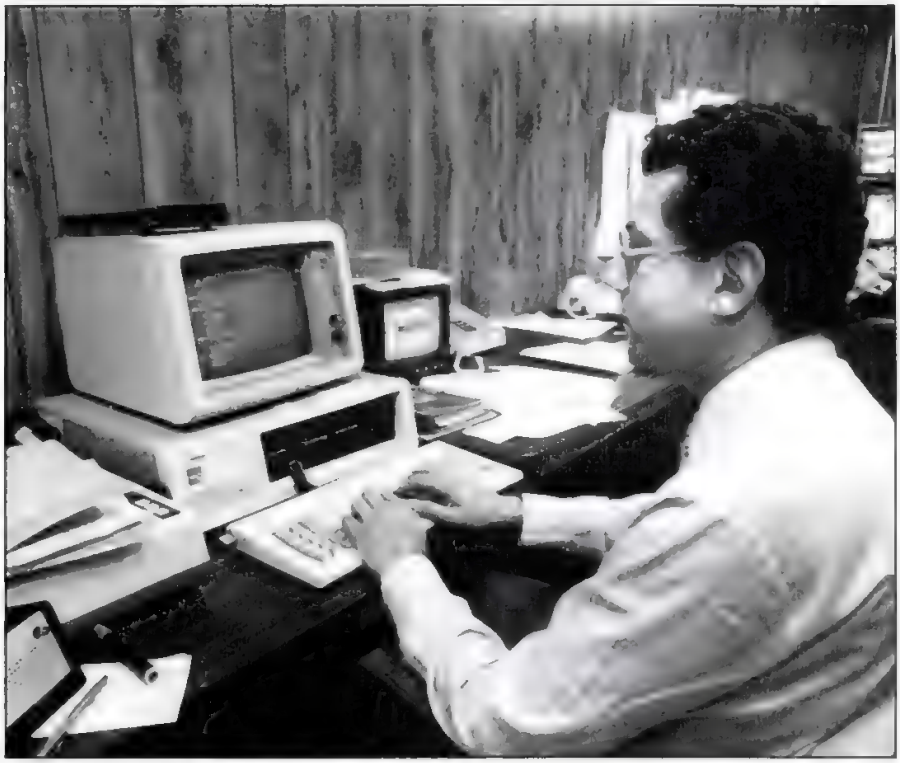
Transend is on trial at computer and software stores everywhere or from:

TRANSEND
2190 Paragon Dr.
San Jose, CA 95131
(408) 946-7400

TRIAL SIZE
Allows up to 15 phone calls.

CIRCLE 533 ON READER SERVICE CARD

Copyrighted material



CBS researchers punch queries into PCs linked to the CBS News political database.

family and her career. Many ran to Nexis terminals planted in the news rooms that were pitched behind curtains adjacent to the convention floor. (In Dallas, Nexis exhibited this database library to all, demonstrating software that allows you to link an IBM PC to their service.) CBS correspondents, however, ran to the network's researchers, who simply punched their queries into PCs linked to the CBS News political database in New York. Printouts of all pertinent information about this representative from Queens were on the correspondents' desks within minutes.

CBS News stores its political database on the research unit's mini, as opposed to on the corporate mainframe, for precisely such times as that, when they need information immediately. For the same reason, Silverman adopted a long-term strategy for election coverage—to transfer as much computer power as necessary to the convention site. As he explains, "We used to handle most of our functions from the mainframe. This wasn't an ideal way of doing things because we were relying on the response time from a computer that is doing other things that we can't control." Silverman sees the trend to more computers at the news sites increasing, aided by IBM's new AT line.

The Chyron Connection

One of the more interesting applications of the IBM PC at last summer's political confabs involved tracking convention roll calls in action and then generating the numeric results for broadcast on national television. Alongside one of the PCs in the Dallas research trailer, a stacked pair of television sets were tuned to the CBS broadcast. A loudspeaker that tapped into the network's radio pool also blared the proceedings. When a roll call was taken, these sources alerted a PC operator, who keyed in the results as they were announced. The software followed a menu-driven listing of states (in the order they were scheduled to be called) and automatically tabulated a running total. It also calculated the number of abstaining delegates. That PC was attached by cable via an RS-232 connection to the CBS broadcast center beneath the convention floor, where the computer instructions set into motion the text and color capabilities of an $80,000 character generator manufactured by Chyron. The roll call results that originated at the IBM PC terminal were broadcast with more clarity and dimension than any unassisted IBM PC color/graphics board could offer. The procedure could easily be compared to a Toyota pushing a bulldozer.

"We perform all the functions that an operator would perform at the Chyron keyboard, but at a much higher speed and with some degree of intelligence," Silverman said. "We're taking advantage of the PC's computing ability and the fact that it can react much faster than a human operator when it comes to making changes and tabulations on the spot." But Silverman made sure that it was clear that CBS is not producing the graphic information with the PC. "We're just supplying the character generator with the information."

Silverman demonstrated what the PC-Chyron connection could do by punching up the roll call file on APL. He could reverse the order of the candidates on the screen or show percentage totals within one decimal point accuracy. Convention rules allow states to defer to others or pass during roll calls; the program is able to cope by inserting any state at any time. It can handle all the alphanumeric maneuvering live, on the air. The richly colored numbers you saw flashing on your TV when Reagan and Bush were nominated with a single roll call last August passed through a PC in Silverman's research unit.

Despite the potential of this PC application, it may become obsolete. Today's conventions don't hold many surprises during roll calls. Moreover, roll calls are becoming less and less frequent. The 1984 Democratic conclave had only two, of which only one (that for President) was

Qubie' gives you the three Pluses: Quality, Service, & Low Prices

We were tempted to headline this ad with "The 1, 2, and 3 of why you should buy AST from Qubie'." We are as tired of ads with that logo as you are, so we settled on three pluses. Actually, the plus really tells it better. The AST Research plus of quality is the reason they have the number one expansion products for the IBM PC. The Qubie' Plus of service has made us the largest AST dealer. You don't supply the likes of IBM, Exxon, General Motors, and Lockheed, unless you have premier products and service. Top it all off with low, Qubie' prices, and you have the reason tens of thousands of corporations, institutions, and PC owners have come to Qubie' for their expansion needs.

Take Your Choice

We have the range of multi-function boards for IBM PC's and compatibles that gives you the choice of functions right for your needs. The AST Research MegaPlus II™ is the most flexible expansion product available for the PC. It's younger brother, SixPakPlus™ is the standard the competition measures themselves against. I/O Plus II™ is the answer for those who need serial and printer ports and automatic time and date loading, but already have their memory needs satisfied. Monograph-Plus™ is a multi-function monochrome graphics board. It offers the high resolution of the IBM monochrome board, along with flicker-free 1-2-3™ graphics, clock/calendar, printer port, and optional serial port.

Standard with Mega', SixPac' and I/O is the award winning AST SUPERPAK software. You get SUPERDRIVE™ electronic disk emulation and SUPERSPOOL™ print spooling software.

MegaPlus II™

$329 Includes:
- Clock/calendar with battery back-up
- Asynchronous communications port (RS232C serial, COM1 or 2)
- Memory sockets for up to 256K
- AST SuperPak Software & Q-Quick Menu

Options:

64k memory	$55	GamePak	$40
2nd async port	$35	MegaPak 256k	$299
Printer port	$35	MegaPak 128k	$199

I/O Plus II™

$149 Includes:
- Clock/calendar with battery back-up
- Asynchronous communications port. (RS232C serial, COM1 or 2)
- AST SuperPak Software & Q-Quick Menu
- One year Parts & Labor warranty

Options:

Game Port	$35
Printer Port	$35
2nd Async Port	$35

SixPakPlus™

$329 Includes:
- Clock calendar with battery back-up
- Asynchronous communications port. (RS232C serial, COM1 or 2)
- Memory sockets for up to 384k
- Parallel Printer Port (LPT1 or 2)
- AST SuperPak Software & Q-Quick Menu

Options:

64k memory	$55
Game Option	$35

MonographPlus™

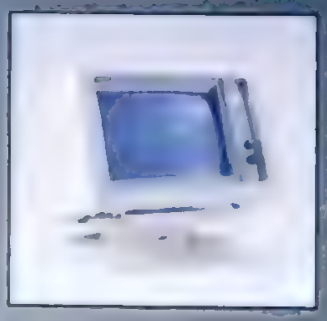
$449 Includes:
- IBM PC compatible Monochrome Card
- 720×348 1-2-3™ compatible graphics
- Clock/calendar with battery back-up
- Parallel Printer Port
- AST SuperPak Software & Q-Quick Menu

Options:

Serial port	$35

The Qubie' Plus

Good service starts with answering your questions before you buy. It continues with same or next day shipment of your order. And if your board ever needs service, we perform repairs in our own service department within 48 hours or we replace the board. You also get no cost extras like the Qubie' bracket which allows ribbon cables to be mounted without interfering with other expansion slots. Or the Q-Quick Menu™ which provides easy arrangement of Super Drive's and the size of your SuperSpool printer buffer.



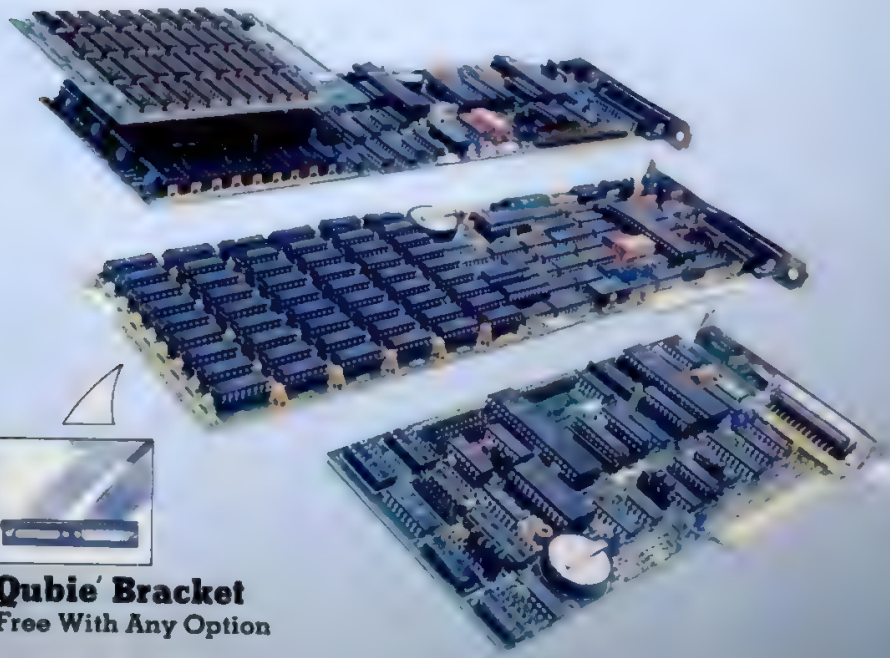
Free **Monitor Stand with purchase of MegaPlus-256K or SixPacPlus-384K. $39 value.**

The Acid Test

Remember, our price is the whole price. No extra charges for shipping, insurance, credit cards, or COD fees. In a hurry? UPS 2nd day air service is just $5 extra. If you are not completely satisfied with any Qubie' product after 30 days, you can return it for a full refund. We will even reimburse you for the postage to return it. If you can get any of our competitors to give you the same guarantee, buy any other board you think compares and return the one you don't like. We know which one you'll keep.

CIRCLE 333 ON READER SERVICE CARD

IBM is a trademark of International Business Machines Corporation.



Qubie' Bracket
Free With Any Option

Order Today, Shipped Tomorrow!

Price includes UPS surface freight and insurance. Add $5.00 for two day air service. For fastest delivery send certified check or credit card. Personal checks take 18 days to clear. Calif. residents add 6% sales tax. Corporations and Institutions call for purchase order details.

(800) 821-4479
Toll Free Outside California

(805) 987-9741
Inside California

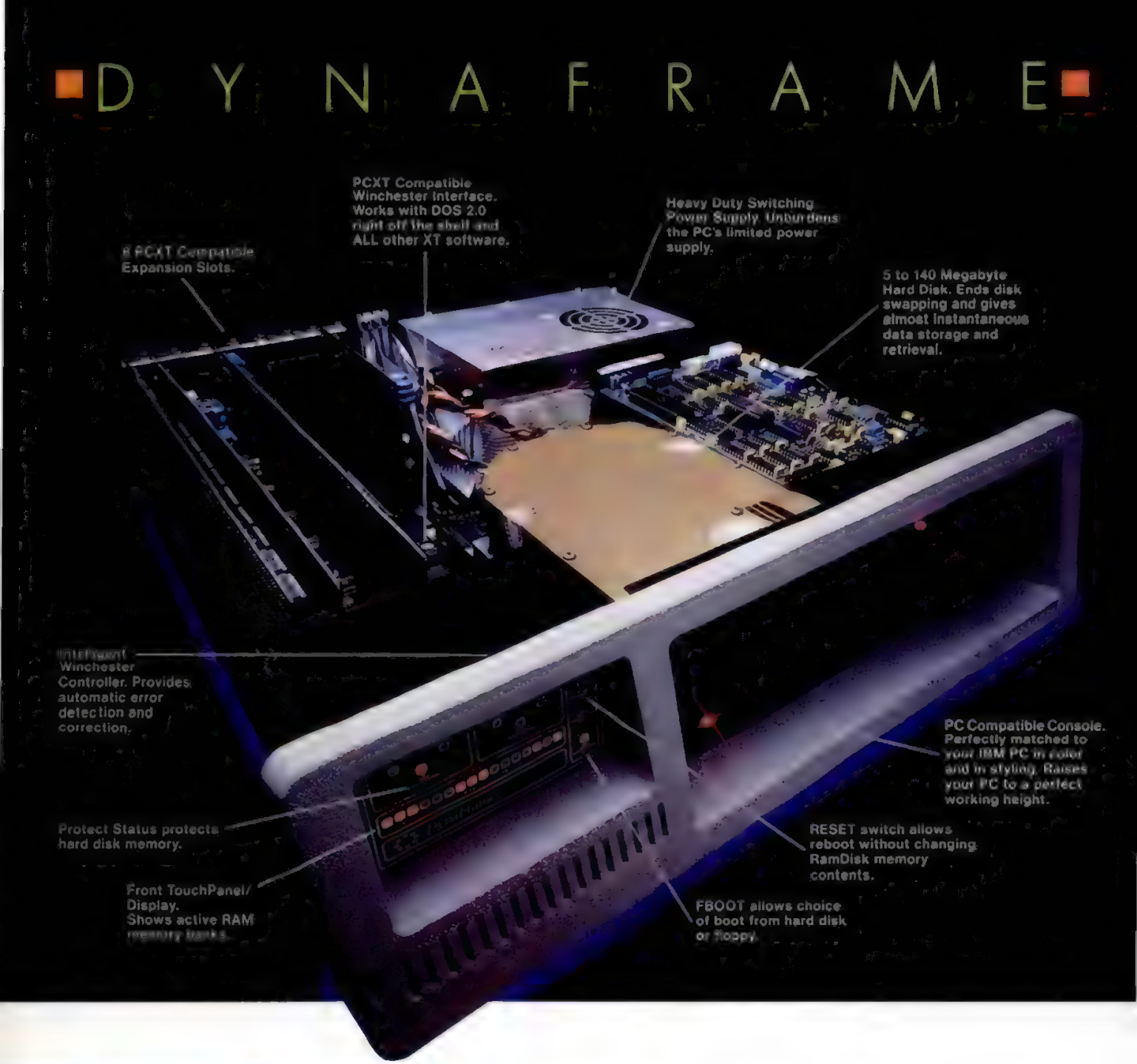
QUBIE'

4809 Calle Alto
Camarillo, CA 93010

Tempo House, 15 Falcon Road,
London SW11 2PH, United Kingdom

Copyright Qubie 1984

DYNAFRAME



Turn Your PC Into an XT+!

DynaFrame is a combination of a hard disk drive with your choice of storage capacity (from 5 to 140 Megabytes ... 8 PCXT compatible expansion slots... high speed backup and added control through the Front Touch Panel/Display. And, unlike many other sub-systems, DynaFrame is totally compatible with IBM XT software... no software patching is needed!

You have your choice of several back-up systems. Select from a 5 or 10 megabyte removable hard disk drive . . . a high density floppy disk drive . . . or a 25 megabyte streamer tape.

See the new DynaFrame at your local computer specialist or write for detailed information.

IBM PC and IBM XT are trademarks of International Business Machines. DynaFrame is a trademark of Vista Computer Co., Inc.

Vista COMPUTER COMPANY, INC.
1317 E. Edinger Avenue, Santa Ana, CA 92705
(714) 953-0523

CIRCLE 178 ON READER SERVICE CARD

© 1983 Vista Computer Co

aired. The Republican convention held only one roll call.

As a result, the excitement of convention coverage these days can best be described as "low key." If anything, Silverman maintains, the conventions are "warm-ups for the real thing."

One Chance

The real thing is always the election itself. And on election eve there are generally plenty of upsets, surprises, and one overriding rule: nothing can go wrong, since, as Silverman explains, "In live broadcasts you get only one chance."

As a result, at CBS, as at all the networks, a great deal of tension accompanies the event. The research staff and the correspondents follow hundreds of state and federal elections, using the staff's PDP-11 as well as the corporate mainframe.

> IBM doesn't want some announcer to say that the returns have been disrupted because of a problem with the computer.

In fact, for election night, IBM's media sales force in New York set up a special election unit designed to back up and supply hardware for each of the major network's news coverage units. As Silverman explains, "IBM doesn't want some announcer to say on nationwide television that the returns have been disrupted because of a problem with the computer . . . even if that computer isn't an IBM."

At CBS News IBM computers play a very important role. For election coverage, PCs do double duty as DEC terminals with VT 100 emulator software. The 3270 terminals are on each correspondent's desk; they even circle the election newsroom set. In fact, computer screens are projected on the backdrop of CBS's set by a Panasonic projection TV with RGB inputs, driven by IBM PCs also locked into the corporate mainframe tallies.

At the time of the Republican convention last summer, Silverman even considered planting a PC 3270 in front of anchorman Dan Rather. He thought Rather himself, not just the researchers, should have been able to access information immediately—on the air—via any one of the 24 function keys. Silverman also wanted him to be able to refer to multiple tables and returns at the same time with the PC 3270's windowing capability.

Future Plans

Silverman, it seems, is always making technical plans of this sort or solving hassles with high-tech means. His job includes everything from designing the computer system for election eve to helping *60 Minutes* columnist Andy Rooney connect his Radio Shack Model 100 lap computer to a printer. Computer graphics with the DEC mini is his latest pursuit. With this election year nearly over, he and his staff are already eyeballing new technology for the elections of 1986 and 1988.

Silverman's stint in Dallas for the Republican convention coincided with IBM's news-making announcement there, introducing the PC AT to its dealer force. He witnessed a demonstration of the new product line, which impressed him so much that he expects the AT to play a significant role in the CBS surveys and in the network's election coverage in the coming years.

What technical changes is Silverman considering for CBS News to use in its coverage of the 1988 convention and elections? "In politics you pick a president every 4 years," he responds. "In computer technology things move much faster: 1988 could be several generations away." ■

PC SOFTWARE SALE!

WE'LL MATCH PRICES ON MOST PRODUCTS

LOTUS 1-2-3/ SYMPHONY $309/$425
dBASE II/III $279/$375
WORDSTAR PROF PACK $275
CROSSTALK $99
FRAMEWORK $375
EASYWRITER II SYSTEM $185
PRO KEY $87
HAYES SMARTMODEMS 1200/1200B $489/$409

LOOK AT THESE SPECIAL PRICES!

ATI Training Power	CALL
AST Products	CALL
Crosstalk	$ 99
dBase II/III	$279/$375
EasyWriter II System	$185
Hayes 1200/1200B	$489/$409
IUS Accounting	CALL
Lotus 1-2-3/Symphony	$309/$425
MicroPro Products	CALL
Microsoft Products	CALL
Multimate	$265
Norton Utilities	$ 59
PFS Products	CALL
ProKey	$ 87
Quadram Products	CALL
RBase 4000	$289
SuperCalc 2/3	$149/$199
Volkswriter Deluxe	$175
Wordstar	$209
Wordstar Prof. Package	$275
All Other Products/Diskettes	CALL

To order:
Call TOLL-FREE:
800-227-4780 or 415-845-2651

Or write:
ECONOMY SOFTWARE
2040 Polk Street
San Francisco, CA 94109

ECONOMY SOFTWARE

- We guarantee our products against manufacturer's defects.
- Quantity discounts available. We are experienced with Corporate accounts.
- No surcharge added for charge cards. No charges until products are shipped.
- Purchase orders accepted.
- Call for shipping charges.
- Prices subject to change.

CIRCLE 131 ON READER SERVICE CARD

DUNSPLUS: THE MICRO SOLUTION THAT REFLECTS THE WAY YOU DO BUSINESS

You've heard the buzzwords: user friendly, integrated, smarter, faster, cheaper. But when you push the rhetoric aside you're still asking the same question, "Why can't I get a system that solves more problems than it creates?"

You can. It's called DunsPlus and it's built to respond to your information-related business demands without creating demands of its own.

DunsPlus gives the IBM PC XT a built-in business environment. This lets you mold DunsPlus to fit the way you do business.

Within the DunsPlus environment is a software base of the best. Lotus, MultiMate, Western Union electronic mail (to name but a few), are all ready for immediate use. But additional programs to solve your unique problems can also be added with ease.

Instant, yet controlled, access to your choice of mainframes and subscription databases is also a part of the DunsPlus environment. And transferring data throughout the system is as easy as moving a piece of paper from the In Box to the Out Box.

Immediate end-user productivity is not an issue: DunsPlus is a menu-driven system requiring minimal keystrokes for maximum results.

Installation is not an issue: DunsPlus is installed by IBM.

End-user training is not an issue: Training and support are part and parcel of DunsPlus.

Flexibility is not an issue: Any part of the DunsPlus solution--hardware, software, or service--can be tailored to meet your precise business needs.

In fact, there are no issues. DunsPlus does what you want, the way you want it--now.

Designing systems that reflect the way you do business is business as usual for us. NOMAD2, the premier 4th-Generation-Language/DBMS from D&B Computing Services, has made us a leader in the field of information management services. And as your needs evolve, so do we. DunsPlus is just the latest step in translating technological advances into usable business tools--tools that reflect the way you do business.

DUNSPLUS: AN INNOVATION IN END-USER COMPUTING FROM DUN & BRADSTREET

DunsPlus

a company of The Dun & Bradstreet Corporation

For further information call: 800-DNB-PLUS. Or drop your business card into an envelope and mail it to DUNSPLUS, 187 Danbury Road, Wilton, CT 06897

Lotus spreadsheet and graphics from Lotus Development Corporation. MultiMate™ word processing from MultiMate International, Inc. IBM is a registered trademark of International Business Machines Corporation. DunsPlus is a registered trademark of DunsPlus, a company of the Dun & Bradstreet Corporation. NOMAD2 is a trademark of D&B Computing Services.

CIRCLE 161 ON READER SERVICE CARD

INTRODUCING A NEW BREED OF ELEPHANT.™

The Elephant Organizer™

Introducing Elephant Premium Floppy Disks. They're specially designed for the more demanding needs of business, and because they are, we test them at a higher standard. In fact, 150% of the industry standard. And then, they're certified 100% error-free at that more critical level.

So we can say with confidence that Elephant Premium will protect your data when other disks won't.

Plus, Elephant Premium is the only floppy disk that features The Elephant Organizer™—the easiest way ever to store, reference and protect your disks.

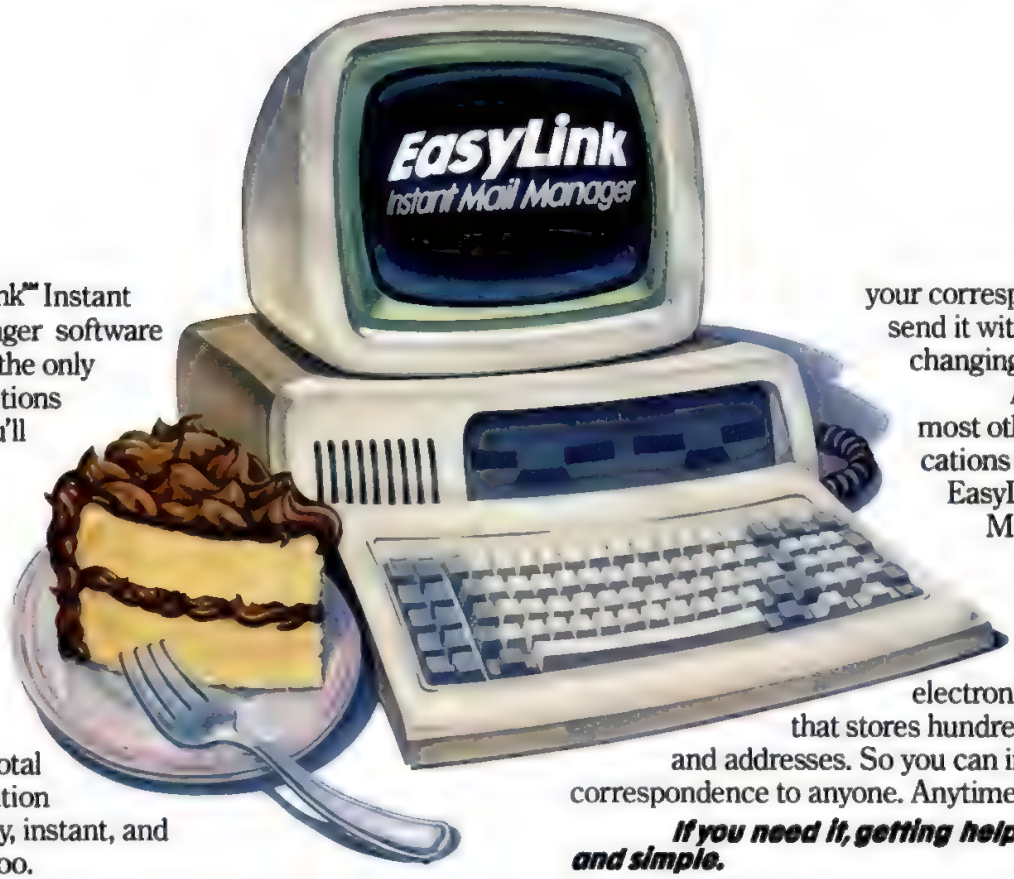
For the Elephant dealer nearest you, call 1-800-343-8413. In Massachusetts, call collect 617-769-8150.

ELEPHANT NEVER FORGETS.™

Dennison

Serving business for over 140 years

Introducing the software that makes communications a piece of cake.



EasyLink℠ Instant Mail℠ Manager software is probably the only communications package you'll ever need. Designed to blend in perfectly with Western Union's EasyLink service, it makes the total communication process easy, instant, and automatic too.

All the right ingredients.

EasyLink Instant Mail Manager works with EasyLink service to provide automatic access and transmission of almost any type or length correspondence over the EasyLink network. So sending mail instantly to virtually any other phone-equipped PC or word processor is a snap.

You can even reach people without equipment. Thanks to EasyLink's instant access to Western Union's Worldwide communications services.

EasyLink Instant Mail Manager also lets you access your company's computer or connect instantly to other business and information services.

The frosting on the cake.

EasyLink Instant Mail Manager is more than simple "send and receive" software. With it, you also have complete word processing capabilities. So you can easily create, edit and change the format of your correspondence, then send it without ever changing software.

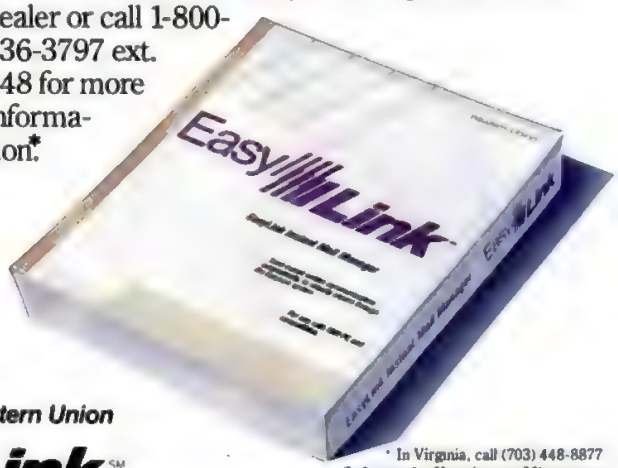
And, unlike most other communications software, EasyLink Instant Mail Manager allows you to create and manage a permanent electronic address file that stores hundreds of names and addresses. So you can instantly speed correspondence to anyone. Anytime.

If you need it, getting help is sweet and simple.

EasyLink Instant Mail Manager is set up to guide you step by step. From how to format messages to how you go about sending them.

EasyLink Instant Mail Manager software and EasyLink service. The perfect mix.

Available now at your computer software dealer or call 1-800-336-3797 ext. 948 for more information.*



Western Union
EasyLink℠

* In Virginia, call (703) 448-8877

Software by Kensington Microware.
Available for the IBM PC, and compatible equipment.

© 1984 The Western Union Telegraph Company

CIRCLE 240 ON READER SERVICE CARD

PROJECT MANAGEMENT WITH THE PC

Graphics: Chris Spollen

Project management, as most business people know, concerns the management of resources and environment to reach a specific goal. Project management software programs are designed to help users handle large and/or multiple projects more easily. These programs seem to increase in number daily.

We divided project management software programs into three categories for our overview: Level I programs offer one or more planning facilities for taking a first look at a project and sizing up the work that will be needed; Level II programs, also capable of progress reporting, can generate status reports; Level III programs allow you to coordinate several projects that share resources.

Surprisingly, approximately two-thirds of the 35 packages included in our overview are Level I programs—too many to include in one issue. So this second part of our three-part series on Project Management software covers the remaining 12 Level I packages.

THE CONFIDENCE FACTOR: DECISION MAKER'S TOOL KIT

PC FACT FILE

The Confidence Factor, Version 2.0 B
Simple Software Inc.
2 Pinewood
Irvine, CA 92714
(714) 857-9179
List Price: $389
Requires: 128K RAM, two disk drives.

CIRCLE 789 ON READER SERVICE CARD

The Confidence Factor is billed as a "decision maker's tool kit" by Simple Software Inc., and for once I've run across a program that lives up to its manufacturer's claims. "Tool kit" implies that a variety of programs designed to handle a spectrum of needs is included in the package. In fact, *The Confidence Factor* includes seven functions to help managers make decisions, evaluate alternatives, track projects, and perform other useful tasks. Its main event is the flexible Critical Path Method module, but its other modules are interesting too.

The Confidence Factor requires no installation other than making a backup copy for protection. The program runs equally well on floppy or hard disk systems. There is no tutorial, but helpful sample files are provided which help clarify the operation of each program module.

The manual states that *The Confidence Factor* is designed for managers with no computer expertise. I believe this assertion is essentially valid because the system is easy to run from a user-interface viewpoint. On the other hand, the system makes some major assumptions about what the user knows about rather arcane analytic management techniques. Many results are displayed for which no explanation is given. If you don't know the definitions of the terms *constraints* and *shadow prices* or what standard deviation means in the context of risk simulation, the documentation won't help. There are also a few minor bugs scattered throughout the program, primarily when moving from menu to menu (the menus don't return when they are supposed to). However, the program runs well in general.

DECISION SUPPORT MODULES

The non-CPM modules include Decision Trees, for evaluating and making tactical decisions; Best Alternative, for structuring and ranking the issues that affect a decision and reaching a conclusion; Risk Simulation, for predicting results; Linear Programming, for finding the optimum approaches to complex decisions; Best Course of Action, for determining the optimal choice among possibilities; and Yes/No Decisions, for ranking clear alternatives. Most of these modules use a spreadsheet-like matrix to input data, with full control over cursor position for easy entry and editing. Several employ the concept of successor events to indicate what occurs after an event. The syntax is not explained well in the manual, especially for more complex scenarios, but the method can be figured out after a while.

To some degree, the greatest benefit of using *The Confidence Factor* is the thought that you must put into defining the factors that have an impact on a decision and ranking their priority. *The Confidence Factor* assists in this process by forcing you to think these issues through thoroughly before you enter data. The results appear almost immediately, and printouts can be easily generated. Also, work can be saved or recalled from disk for future use. Though some of the output is cryptic to the uninitiated, those familiar with the terms involved will be impressed.

UNUSUAL FLEXIBILITY

The Confidence Factor's CPM module offers unusual flexibility and includes several variables not covered by many competitive products at this level. Task data are entered on a matrix with fields for task title, prerequisite tasks (normally up to nine, but more if dummy tasks are used), duration, cost (direct costs, not manpower costs), and an early start date. *The Confidence Factor* works only in what it calls "time units": the printout does not indicate specific days, weeks, months, or whatever real dates or times you choose. This is a weak method and reduces the utility of the output.

● The Confidence Factor's *Gantt chart can be sorted in various ways, including latest-finish order.*

Once the task data is entered, *The Confidence Factor* moves to its manpower cost section. Up to ten human skills and a cost for each are defined in time units the user has selected. For example, if days are the unit being used, the cost for one man-day for each skill would be provided. *The Confidence Factor* then asks for detailed manpower requirements for *each* task in the project. This is a rather tedious entry process, but it makes you think out each and every task in the project.

IMPRESSIVE REPORTS

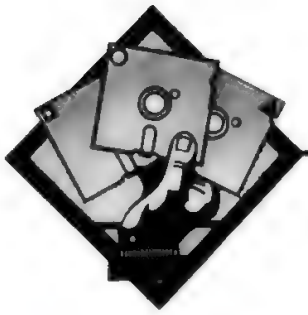
When all the information has been entered, *The Confidence Factor* immediately calculates factors such as the critical path, overall manpower requirements, and costs and then produces an impressive array of reports, including a Gantt chart, complete project data report, job cost report, start/finish report, resource allocation report, and a smoothing report. The Gantt chart is printed in primitive characters and can be printed on almost any printer that can be connected to a PC. The Gantt chart can also be displayed on the screen, but it is cumbersome to move around within a large chart. The manual doesn't explain the significance of any of the output, but an experienced project manager should either be able to understand the data output or figure it out.

The Confidence Factor is an impressive and useful planning tool. Its CPM facilities are generally good, and its other planning aids are nicely done. All in all, *The Confidence Factor* can do a variety of useful analyses for a reasonable price.

—Glenn A. Hart

```
                    GANTT CHART IN LATEST FINISH ORDER                PAGE   2
                LEMON COMPUTER INTRODUCTION

                                          TIME PERIODS
   JOB                100       110       120       130       140       150
                        +---------+---------+---------+---------+---------+----
 36 Investigate Dist.   Isssssssssssssssssssssssssssss
 37 Finance Forecast    Isssssssssssssssssssssssssssss
 38 Train Interviewers  Isssssssssssssssssssssssssssss
 44 Estab. Qual Control Isssssssssssssssssssssssssssss
 49 Find Seasonal DemandI              XXsssssssssssssss
 51 Evaluate Media      I                XXsssssssssssss
 52 Select Name         I              Xssssssssssssssss
 54 Establish Prices    I                XXsssssssssssss
 55 Select Adv Copy     I                Xssssssssssssss
 57 Select Promo Aids   I                XXsssssssssssss
 58 Select Media        I                Xssssssssssssss
 59 Design Label/Tmark  I              XXXXXXXXXXsssssss
 60 Funds Flow Forecast I                   XXsssssssssss
 64 Set Up Equipment    I               XXXXsssssssssssss
 65 Receive Raw MaterialI               XXXXXXsssssssssss
 69 Est. Dist. Channels I                   XXsssssssssss
 70 Det. Service Needs  I              XXsssssssssssssss
 72 Ship to Dist.       I                              C
 73 Intro New Product   I
```



DECISION SUPPORT SYSTEM: HIGH-QUALITY GRAPHS

PC MAGAZINE

Decision Support System
General Software Corporation
8401 Corporate Dr., #502
Landover, MD 20785
(301) 577-8775
List Price: $895
Requires: 256K RAM, one disk drive.

CIRCLE 793 ON READER SERVICE CARD

Whether *Decision Support System (DSS)* from General Software Corporation, of Landover, Maryland, even belongs in this project management series is a real question. The package does not perform most of the functions that the other evaluated programs do, such as calculating critical paths and estimating manpower requirements. Its high-quality graphs are its only redeeming feature.

BUYER BEWARE

GSC believes that any software tool that helps in the management of a project qualifies as "project management software," and, on one level, this view certainly makes sense. On the other hand, potential buyers of *DSS* should be careful to understand both its strengths and its weaknesses. GSC's promotional literature can be misleading until you understand what the system really does. Seeing nicely drawn PERT and milestone charts in its brochure might lead you to believe that the program actually does these complex calculations, but this is not the case.

DSS can produce 11 different types of project management charts: Milestone displays actual and projected dates for the completion of specific tasks; Organization represents interrelationships among the positions in an organization; PERT shows schedule order and accomplishment responsibility of project tasks; Earned Value Analysis monitors the cost performance of a contract or project; Trend Analysis plots cost variance and schedule variance; Resources compares actual versus planned labor or cost value; Bar/Line creates general bar/line graphs, primarily for labor/cost information on period and cumulative bases; Pie shows percentage breakdown of the components of a variable; Bullet creates topic outlines for presentations; N-Square shows the functional breakdown of a project and the interrelations of its subtasks; and Work Breakdown Structure shows the relationships among elements in a system.

DSS does some calculations, such as totaling cumulative charts and figuring variances, on a few of the charts but, for the most part, the user must have already used some other program to derive the inputs to *DSS*. For example, there is no way to calculate the critical path for a project. *DSS* has provisions to indicate the critical path, but you'll have to use some other program to determine it.

A POST PROCESSOR

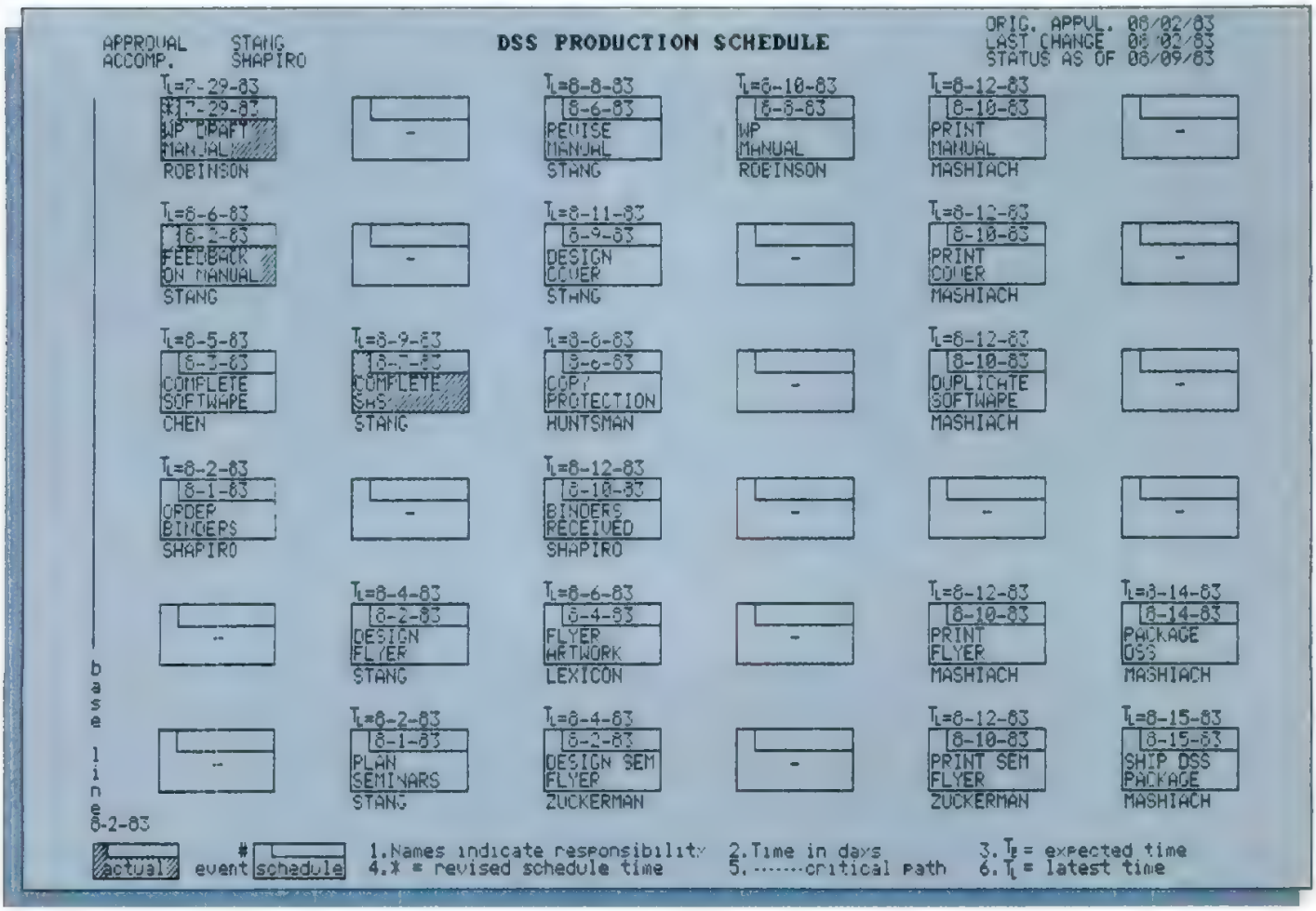
DSS can be considered a "post processor," which produces a higher-quality output from other programs. The graphs produced by this system are much better than those offered by many project management packages. Given this orientation, I think it is rather strange that *DSS* outputs to only a few dot matrix printers, including ones from IBM, Epson, and IDS, and not to plotters. The program can produce a special file that could be used by a plotter driver to produce high-quality output, but

no plotter drivers are supplied or are currently available. The matrix graphics are very good, but plotter output would be far superior. Printer output uses the GRAPHICS command of DOS 2.x, so current versions of DOS should be used.

DSS is supplied on 12 floppies, one for each of the chart types and a "Promate" disk that provides copy protection. All disks and files can be copied, but the Promate disk must be in a floppy drive to exit the system or produce hard copy output. *DSS* is written in Pascal, and the executable program files are often 180K or more, which explains the large number of disks. The system works with floppy or hard disk systems; even hard disk users may be tempted to use floppies rather than tie up two or three megabytes for all the *DSS* files at once. GSC provides a simple install program, which takes only a few minutes to run; inexplicably, it allows hard disk drive designations only up to drive E:. My system uses drives up to I:, and it would be easy for GSC to include more flexibility.

The program requires a color graphics card to produce its nice on-screen graphics. Unfortunately, the IBM's color-mode resolution is insufficient to display the charts in full detail, so *DSS* uses an every-other-line display if the user wants to see the entire chart at once. This program really needs the high resolution of a Hercules-type monochrome graphics board, but

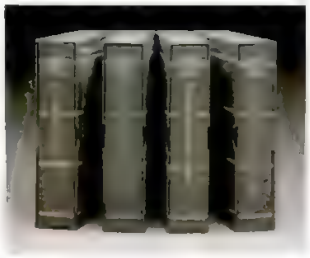
● *Individual task responsibility can be shown on the PERT chart from the* Decision Support System.



Genuine Genius.

When it comes to expert systems, we wrote the library.

Human Edge™ Business Strategy Software. Smart, tough, tactical programs that provide the user with personality profiles of two people dealing in a business situation.



The Sales Edge™ gives you a handle on your prospect. You'll know when to be aggressive. And when to back down. How to best prepare, open and close to sell anyone the way they want to be sold.

The Management Edge™ helps you better analyze, understand and manage the people you work with. You can hold the bright ones. Lose the losers. And keep an easy grip on the reins.

The Negotiation Edge™ helps you size up your opponents. You'll see where they're strong. Where they're vulnerable. No matter what's on the table, a property deal, a merger, or the promotion you're overdue. In short, the Negotiation Edge will help you win.

The Communication Edge™ shows you how to make your conversations and meetings more meaningful and effective. How to make your point with a specific person so there's no doubt that you've said what you meant. And meant what you've said.

In just a few minutes your IBM, Macintosh or Apple II pc will give you a strategic report that's cunningly accurate.

The Sales and Management programs are $250. The Negotiation Edge is $295, and The Communication Edge is $195.

Your personal strategy is as close as your nearest Computer Dealer. Or your phone.

HUMAN EDGE

We Make Computers Think.

1-800-624-5227 (in California 1-800-824-7325)
Human Edge Software Corporation
2445 Faber Place, Palo Alto, CA 94303

CIRCLE 129 ON READER SERVICE CARD

1·2·3

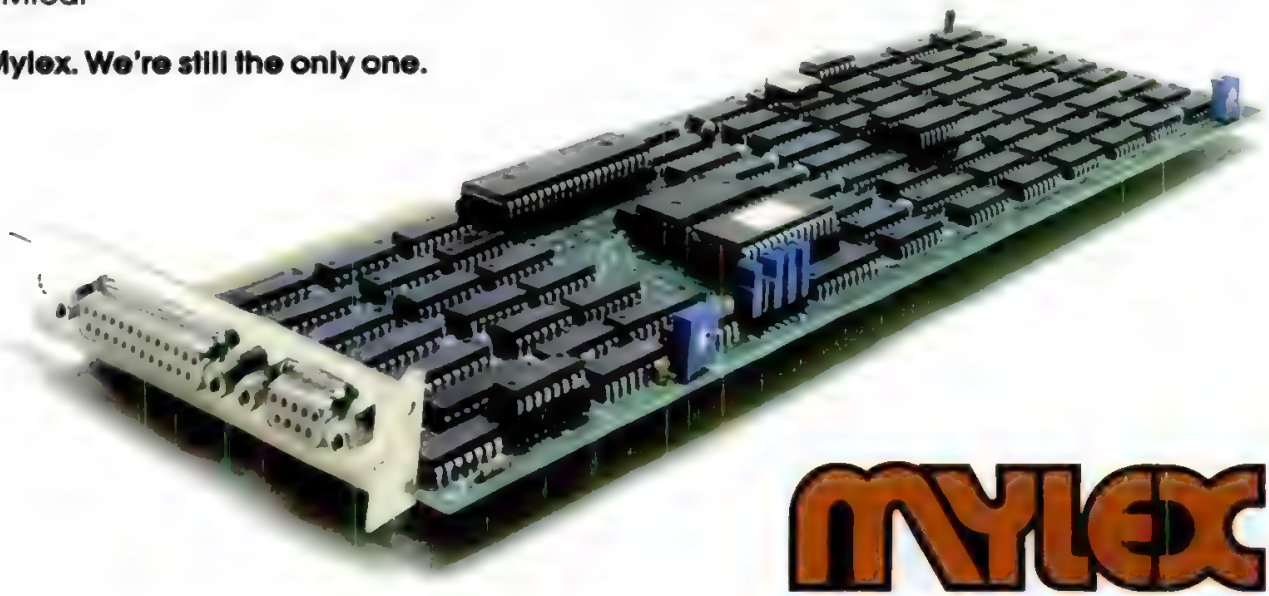
MYLEX – THE ONLY TOTALLY IBM PC/XT COMPATIBLE GRAPHICS BOARD THAT RUNS LOTUS 1-2-3™ ON THE IBM® MONOCHROME MONITOR IN SHADES OF GREEN.

Lotus 1-2-3 runs with 9 x 14 alphanumerics and bit mapped graphics on your IBM monochrome display with the Mylex "Chairman" graphics board. So do Flight Simulator™ and Night Mission Pinball™. So do **all** other IBM software compatible programs. That's because the "Chairman" emulates the IBM monochrome and color/graphics adapter boards. Games, graphs and professional graphics are displayed in shades of green on monochrome displays.

Or the Chairman will drive your IBM color monitor in up to 16 colors. And the Mylex custom character RAM provides you with the equivalent of an APL ROM. Of course the Chairman includes a parallel printer port.

The Mylex software diskette ($150 value) gives you APL characters, your own characters and other enhanced features of the "Chairman": 320 x 200 – 16 colors, 640 x 200 – 4 colors, 640 x 400 – green and black. Retail price is $595 including diskette. Dealer inquiries invited.

Mylex. We're still the only one.



MYLEX™

Mylex Corporation

5217 N.W. 79th Avenue • Miami, Florida 33166 • (305) 592-9669 • 800-446-9539 • 800-336-9539 (FLORIDA)

• Lotus 1-2-3 is a registered trademark of Lotus Development Corp. • Flight Simulator is a registered trademark of the Microsoft Corp. • Night Mission Pinball is a registered trademark of the Sublogic Corp. • IBM is a registered trademark of the IBM Corp.

CIRCLE 372 ON READER SERVICE CARD

GSC doesn't support this option. *DSS* can display four quadrants of the full chart or a variable position window showing about ¼ of the total chart, and the cursor controls can be used to move the window view to any position on the chart. This useful compromise shows the portion of the chart selected in good detail. The program displays the entire chart in color, black-on-white, or white-on-black.

LOGICAL MENUS

DSS is menu-driven, and logical menus lead the user through initialization and into the data-entry and chart-production phase. The system has its own directory of stored chart data and includes utilities to reload, rename, delete, and manipulate stored files. All data must be entered directly into *DSS*, though GSC promises a future enhancement to allow downloading of data from external sources.

The system uses the Shift, Ctrl, and Alt keys as well as standard function keys very effectively. The key definitions are fairly consistent in all 11 chart modules, with a few of the keys modified for specific charts. The manual does not help you get comfortable with this program, but, after a few minutes of use, the elegance of the design becomes apparent. The documentation, by the way, is a photocopied word processor printout, and it has several errors and strange usages. I won't rate it poor, but it clearly needs revisions.

No disk tutorial is provided, but sample charts and instructions on entering new demo charts are helpful. There is also on-screen, context-sensitive help available. A portion of the screen is used to display selected function key commands (there isn't room for all of them), but this part of the display can be turned off by experienced users.

A GRAPHICS MODE

Some of the chart programs work only in a graphics-oriented mode, while others use both text and graphics. *DSS* prompts the user for input wherever possible, and, after a brief familiarization period, you will find data entry quick and easy.

The printed output produced by *DSS* is good, but plotter output would be far better. The charts are produced quickly.

General Software is primarily a consulting firm dealing with the government. *DSS* has evidently had reasonable success in this market, but it's too costly for even corporate microcomputer users. It works quite well and uses the IBM color capabilities nicely, but I think it needs further development to reach a wider audience among serious project managers.

—Glenn A. Hart

GANTT-PACK: TIME FACTOR FLEXIBILITY

PC TECH FILE

Gantt-Pack, Version 3.0
Gantt Systems Inc.
495 Main St.
Metuchen, NJ 08840
(201) 494-4752
List Price: $395
Requires: 128K RAM, two disk drives.

Gantt-Pack is a Gantt chart generation package designed by Gantt Systems for small business and manufacturing systems projects. The program offers flexibility with a variety of time factor options, particularly for multiple events with no clear critical path or terminations.

A COMPLEX MANUAL

The manual states that every effort was made to make the program easy to use, but, unfortunately, *Gantt-Pack* doesn't live up to that billing.

It took me 2 to 3 hours to familiarize myself with the program, an excessive investment of time considering the value received and the program's relatively simple user interface.

The *Gantt-Pack* documentation assumes you know how to use your computer and how to make a copy of the distri-

bution diskette. There is no other installation action required for the IBM PC version of the program. The manual includes good screen representations, and the directions for the use of each screen are clearly written. The *Gantt-Pack* manual includes no index, but I think one would be very useful.

NO ON-LINE HELP

If you lose the *Gantt-Pack* manual and haven't used the program for a couple of weeks, you are out of luck because the program provides almost no on-line help, and the prompts and input methods are different enough from common practice to be confusing if you haven't used them repeatedly. For example, to make selections from the menu, you must simultaneously enter the first letter of the name of the menu section you want and the bracketed number next to the subsection you want. I found the combination to be confusing because the first letters of the menu sections are not highlighted or bracketed or visually set off in any way. In addition, this program does not show you the data files on the diskette. You have to know the name of the data file you want to use before you start the program. Although these are minor flaws that are quickly overcome, they are all the more annoying because they could have easily been avoided.

Since data entry is a critical task demanding the utmost in accuracy, you might expect the data entry screen to prompt for the information, provide a picture of what has already been entered, and check for errors. The *Gantt-Pack* data entry screen does an adequate job of prompting, but you have to mentally transport the field labels from the top of the screen where they are displayed to whatever line you are working on at the time. You need eagle eyes for this work. The screen is so tightly packed with data that you can easily lose your place if you glance away. Moreover, the program does not beep or flash an error signal if you enter something incorrectly. Although it will not accept the improper entry, it doesn't tell you it refused the entry. In other words, if you don't notice that the line above the cursor doesn't include the last entry you typed, you won't discover your error until you look at the final chart.

THE CASE STUDY

It took me almost 2 hours to enter the *PC* case study into *Gantt-Pack*. Part of this time was spent simply trying to understand the format used for defining the various data entry fields. *Gantt-Pack* allows you to enter not only the task but also a name of a phase, which is a large group of tasks. I designated tasks as being in either preproduction or post-production decision phases.

The time element entry format in *Gantt-Pack* is designed to be flexible, but

```
                    G A N T T   C H A R T          LEGEND
TITLE: New Product Programs                  ORIG'NL PLAN   (.....)
CREATED: 07/23/83 UPDATED: 07/23/83          REVISED PLAN   (.....)
UNITS: DATES                                 TASK STARTED   [==...)
Use 4628 to scroll, type (M) for menu.       TASK COMPLETE  [=====]
-----------------------------------------------------------------------
CODE      FEB68     AUG68     FEB69     AUG69     FEB70     AUG70
Pre Decision
AJ-D      !         !         !   ()    !         !         !
AK-M      !    )    !         !   (     !         !         !
AM-M      !         !        ()         !         !         !
AN-L      !         !        ()         !         !         !
AO-A      !         !         ! )       !         !         !
AQ-D      !         !         !       ) !         !         !
AR-L      !         !        !()        !         !         !
AT-A      !         !         !       ) !         !         !
AU-A      !         !        )!         !         !         !
AV-L      !         !         !       ) !         !         !
AW-A      !         !         !         !   ()    !         !
AX-L      !         !         !         !    )    !         !
AY-A      !         !         !         !     )   !         !
BA-B      !         !         !         !         ()        !
BB-A      !         !         !         !         ! ()      !
BC-D      !         !         !         !         )         !
```

● *Gantt-Pack's Gantt chart shows original and revised plan data and started and completed tasks.*

it became a burden when I tried to apply it to the case study because the *PC* model wasn't designed with *Gantt-Pack*'s variety of time element options in mind. The program's time entry element allows you to choose dates, hours, or other measures of time when you initially set up the data entry format. The "other" category gives you flexibility to use measures such as worker hours, number of days, picoseconds, or any other standard factors. If you know these options are available to you when you diagram the steps in the project, you can choose a combination of factors to fit your program. The *PC* model uses starting dates and then projects the number of days each action will take. I was then faced with the choice of using the first event as "day zero" and then translating every following date into day 0+ or sticking with dates and then manually translating every task duration into a completion date. You could avoid this translation task if you knew you were going to use *Gantt-Pack*, but predesigning the project description to the program is not always possible.

It is relatively easy to edit the task data in *Gantt-Pack*. I added and deleted tasks, and the program responded quickly each time. *Gantt-Pack* cannot automatically take holidays into consideration, nor can it produce resource management reports.

SPECIAL FEATURES

Gantt-Pack software has been marketed in CP/M and TRS DOS versions since 1978. The PC version of the program is not customized to the IBM keyboard or video graphics but will run on almost all MS-DOS machines, including the Tandy 2000.

Gantt-Pack produces charts that do not include any graphic characters or designs, so they can be run off on any printer capable of generating 132 columns of print. The program has the ability to send a prestored string of characters to the printer, so it is possible to put the IBM PC printer or similar dot matrix printers into a compressed-print mode. This produces squeezed charts, and their practicality depends upon the time increments you have used. For instance, if your project has small time increments, such as a day or two, you would not find this print mode useful because your squeezed chart would probably consist of only a back-to-back set of brackets.

FOUR PRINTED PRODUCTS CAN BE PRODUCED BY GANTT-PACK: LISTINGS OF ORIGINAL DATA, REVISED DATA, A FAIRLY STANDARD GANTT CHART, AND A CRITICAL MILESTONE CHART HIGHLIGHTING TASKS RUNNING LATE.

The program is not copy protected, so it can be easily run in a hard disk system. However, since the entire program resides in RAM, the only advantage to using a hard disk system is the speed of data-file access.

Gantt-Pack has the ability to write files in a format that can be imported by Lotus's *1-2-3*. You must set some parameters in *1-2-3* for it to accept the *Gantt-Pack* format, but this should not present a problem, because these steps are clearly described in the *Gantt-Pack* manual.

PROGRAM CAPABILITIES

Gantt-Pack is an appropriate program to use if you have a number of parallel or random tasks as opposed to serial ones. According to a representative of Gantt Systems, the program has been successfully used by small-business managers and by educators for class scheduling. These are appropriate applications because they have many simultaneous or repetitive tasks but do not necessarily require a clear critical path. You can enter an unlimited number of open-ended tasks into *Gantt-Pack*.

Four printed products can be produced by *Gantt-Pack:* a listing of the original data, a listing of revised data, a fairly standard Gantt chart, and a critical milestone chart highlighting tasks that are running late. The critical milestone chart shows the status of the tasks as of the date or time the chart was produced. *Gantt-Pack* defines critical milestones as a special category or group of tasks with only an ending date.

A *Gantt-Pack* special feature is its ability to sort the tasks according to ten different criteria, including phase, task, code, start date, and end date. I didn't like the fact that the Gantt and milestone charts provide only numbers, not names of the events. The only way you can get the names of the events is to cross-reference the event codes on the charts with the printout of original or revised data, a somewhat bothersome extra step.

SUMMARY

As far as value is concerned I believe *Gantt-Pack* is a little overpriced and too difficult to use for the capabilities it provides. However, it may be appropriate for certain applications that incorporate many parallel tasks.—**Frank J. Derfler, Jr.**

MICROSOFT PROJECT: GREAT VALUE AT $250

PC FACT FILE

Microsoft Project
Microsoft Corporation
10700 Northup Way
Box 97200
Bellevue, WA 98004
(206) 828-8080
List Price: $250
Requires: 128K RAM.

CIRCLE 746 ON READER SERVICE CARD

As every space-adventure fan knows, computer programs have personalities. Some are easier to take than others. Sometimes the most talented are not the easiest to live with. With programs, as with people, we can accept certain weaknesses if the strengths are on our "wanted" list. *Microsoft Project* is a likeable program that doesn't pretend to have it all.

GETTING STARTED

Microsoft Project is efficiently packaged in Microsoft style. The manual comes in a plastic "EaselBox" that doubles as a bookstand; it makes those first hours of thumbing through the manual just a little more comfortable. The reference manual is well illustrated, well organized, and includes an index.

Microsoft's programs are all copy protected in a similar way: You can make one copy of the program disk and one copy of the backup program disk. Screen prompts to perform the copy procedure are easy to follow. Installation takes only a few minutes, and the documentation is clear on the subject.

One of *Project*'s outstanding features is that it is extremely easy to use. The tutorial, which takes only half an hour to complete, gives you a good overview of the program, and it's well documented, with clear instructions and illustrations.

Project is completely menu-driven, which made entering the case-study data quick and easy; it took just over an hour. Unfortunately, the case study didn't make use of one of *Project*'s strongest features: resource allocation and costing.

Project produces a number of reports that are useful for project control. A visually unimpressive Gantt chart prints sideways by default, which is nice. The Project Detail report devotes a full page to all available information on each activity, including a cost summary of all resources assigned to that activity.

The Table report summarizes information for each activity, such as its duration, early and late start and finish, available slack time, and whether or not the activity is critical. The Resource report lists each resource and gives a summary of time committed and costs.

DESIGN

Project uses a design similar to Microsoft's *Multiplan*, *Word*, and *Chart*. Command choices appear at the bottom of the screen; you can enter a command by entering the first letter or by using the arrow keys to highlight it and pressing Return.

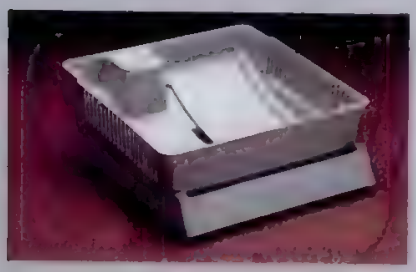
Three screens are available: the Calendar screen, where the work calendar is defined; the Resource screen, where a table of resources and their related costs appear and where new resources can be

Copyright 1984 Curtis Manufacturing Co., Inc.

First things first.

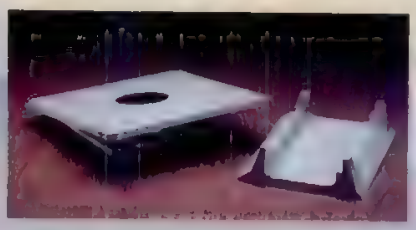
The Curtis System.
Before you set up your IBM PC, set yourself up with the Curtis System. Our PC support products let you arrange and adjust your monitors, keyboard, and system unit according to your individual taste and requirements. Some people call it ergonomics. We call it common sense.

And our new line of surge protectors will guard against computer and data errors caused by intermittent power surges and line static.



The **PC Pedestal II** tilts 30° and swivels a full 360° to give you an ideal line of sight to your IBM PC monochrome or color display $49.95

The **AD-1 Adapter** for the **PC Pedestal II** fits onto the PC Pedestal for Princeton Graphics Systems and Quadchrome displays $9.95



The **UNI-1 Low Profile, Universal Tilt and Swivel Base** is designed for use with any monitor. It tilts 22° and swivels 360° $49.95

The **SS-1 System Stand** lets you put your system unit on the floor, freeing desk space, and reducing system wear by holding the unit securely in a vertical position $24.95

All Curtis **Surge Protectors** come with a lifetime performance warranty Write for technical specifications.

Diamond SP-1: Switched surge protection; plugs directly into the wall $49.95

Emerald SP-2: Switched surge protection; comes with 6 ft. power cord $59 95

Sapphire SPF-1: Switched surge protection; EMI and RFI filtering; plugs directly into the wall $79.95

Ruby SPF-2: Switched surge protection; EMI and RFI filtering; comes with 6 ft. power cord $89.95

EC-1 Extension Cable Set (3 ft.) for IBM PC monochrome display $49.95

EC-4 Extension Cable Set (3 ft.) for IBM, PGS, Quadchrome, any RGB color displays $57.95

EC-2 Keyboard Extension Cable (3 to 9 ft. range, coiled) for IBM PC and compatible keyboards $39.95
A free keyboard cover is included with our cables and cable sets.)

PA-1 Monitor Plug Adapter for connecting non-IBM monitor power cables to the IBM PC systems unit $8.95

The **AD-2 Adapter** fits securely on our **UNI-1 Tilt and Swivel Base** to accommodate Compaq and IBM portables $19.95

Manufacturing Company, Inc.

CURTIS

Curtis Manufacturing Company, Inc.
Peterborough, NH 03458

Available at all ComputerLand Stores, Sears Business System Centers, Entré Computer Centers, Inacomp, Micro Age, or your local PC dealer. Over 1000 locations nationally. In Canada: MicroComputer Products, P.O. Box 235, Ajax Ontario L1S 3C3, 416/427-6612
For the dealer nearest you, call Curtis at 603/924-7803

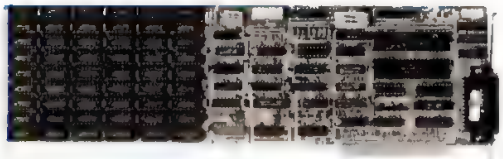
CompuAdd

COMPUTER ADD-ON PRODUCTS

DISCOUNT PRICES & FREE SHIPPING

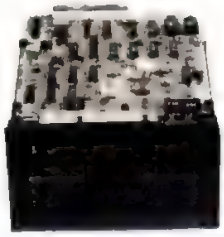
IBM PC
Call for Price

COMPAQ PORTABLE
Call for Price



QUADRAM
New expanded Quad Board w/64k, upgradable to 384k, clock calendar, parallel & serial ports, game port, I/O bracket and Quadmaster software . . . **$269**

TEAC FD 55B
5¼ Double Sided Half Height, 40 TRK, 48 TPI . **$159**



CONTROL DATA CDC 9409
5¼ Double Sided 40 TRK, 48 TPI **$179**

AST SIX PAK PLUS
W/64k, upgradable to 384k bytes, clock calendar, parallel & serial ports, Superspooler and Superdrive software. (optional game port) **$259**

EVEREX HARD DISK
Low power 10 MB Everex Hard Disc, controller, cables, instructions . . . **$795**

MEMORY CHIPS 64k
(150 or 200ns)
Set of nine chips **$45**

8087 MATH COPROCESSOR CHIP
$169

SOFTWARE

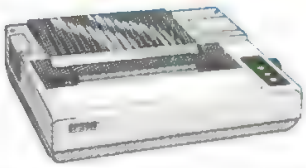
dBase III	$495
Framework	$495
pfs File	$ 99
pfs Report	$ 99
Wordstar (ProPak)	$359
Norton Utilities	$ 59
Crosstalk XVI	$135
Hayes Smartcom II	$ 99
Koala Pad w/software	$ 99
Set-FX+	$ 49
Volkswriter Deluxe	$199

H. P. CALCULATORS

HP 11C	$ 64
HP 12C	$ 99
HP 15C	$ 99
HP 16C	$ 99
HP 41CV	$209
HP 41CX	$259
HP 71B	$399

CALL FOR PRICES ON OTHER HP HARDWARE

EPSON



RX 80 (100 CPS, Par-10")	$Call
RX 80 FT (100 CPS, Par-10")	$Call
FX 80 (160 CPS, Par-10")	$Call
RX 100 (100 CPS, Par-15")	$Call
FX 100 (160 CPS, Par-15")	$Call
LQ 1500 (w/parallel interface) (200 CPS, 67 LQ)	$Call

PRINTERS

OKIDATA

ML 92 (160 CPS, Par 10")	$459
ML 93 (160 CPS, Par-15")	$679
ML84P (200CPS, par-15")	$829

TEXAS INSTRUMENTS

TI855 w/Tractor Feed	$835

JUKI

6100 (18 CPS, Par-13")	$449

SMITH-CORONA

D-200 (120cps, fric/trac NLQ mode)	$Call
D-300 (140cps, fric/trac NLQ mode)	$Call

BOARDS

AST

AST Monograph Plus Lotus 123 graphics on monochrome card, parallel port, clock/calendar (optional serial port) $349

AST I/O Plus Serial port, clock calendar (optional 2nd serial port or parallel port) $129
optional serial or parallel port $35

AST Memory expansion board w/64k, upgradable to 384k, clock/calendar, includes Superspooler and Super drive $239

AST Mega Plus II w/64k, Clock Calendar & serial port (options available—parallel, game or second serial port) $269

HERCULES

Monochrome/Graphics Card w/parallel port $349
Color/Graphics Card w/parallel port $189

PARADISE SYSTEMS

Multi-display board (both monochrome & RGB) $339

PERSYST

Monochrome Adapter Card w/parallel port $199

QUADRAM

Quad Color I color/graphics card $209
Quad Color II (Add-on) $229

MONITORS

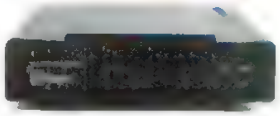
PRINCETON MONITORS

HX 12 RGB (690 x 240)	$489
MAX 12 Amber Monochrome	$195

AMDEK

310 A	$175
300 A	$149
300 G	$139

MODEMS



Hayes 300 Baud	$209
Hayes 1200 Baud	$475
Hayes 1200 B (internal) includes Smartcom II	$419

CORPORATE AND INSTITUTIONAL ACCOUNTS

Our national accounts division is dedicated to providing the prompt professional service required to keep your business running smoothly. We have separate local and TOLL FREE telephone lines to connect you directly with our national accounts representatives who have the latest information on volume quotes and availability of the products you need. We accept P.O.'s on a net terms basis, offer same day shipping, free fully insured UPS ground shipment. We offer a full-time technical staff to answer any questions that might arise and to make fast repairs if needed. Call our national accounts staff today. We make your job easier.

Within Texas—
512/250-9896.
Outside Texas—
1-800-643-0992.

OUR POLICY

We accept Mastercard, Visa, Money Orders, Certified Checks, Personal Checks (allow 10 days for processing), COD, Company/Institutional P.O.'s and Wire Transfers. No credit card surcharge. We do not charge your card until we ship (usually within 24 hours). We pay shipping (UPS ground, fully insured) on orders delivered in continental U.S.A.

Add 5% sales tax if Texas resident. Prices are subject to change. All equipment carries a new factory warranty. Any return item must be accompanied by a return authorization number.

CALL TOLL FREE

For product information, price quotes, technical support and orders call: Within Texas (512) 250-1489 or Telex 887722. Outside Texas

(800) 531-5475.

MAIL ORDER:
12103 Technology Blvd.
Austin, Texas 78727

RETAIL OUTLET
5720 Bandera Rd. #14
San Antonio, Texas 78238
512-684-8010

RETAIL OUTLET
12034 Research Blvd., #1
Austin, Texas 78759
512-250-8594

RETAIL OUTLET
2894 Bee Cave Rd.
Austin, Texas 78746
512-327-4825

CIRCLE 228 ON READER SERVICE CARD

entered; and the Activity screen, where individual activities are entered and displayed on a Gantt chart.

The program is extremely easy to use. The first step is to set up the work calendar on the Calendar screen. You select work days or declare holidays using the space bar and the arrow keys. It takes only 5 minutes to set up a calendar for 5 years of a typical 5-day work week with half-a-dozen holidays. Once you set up a calendar, you can use it with any project.

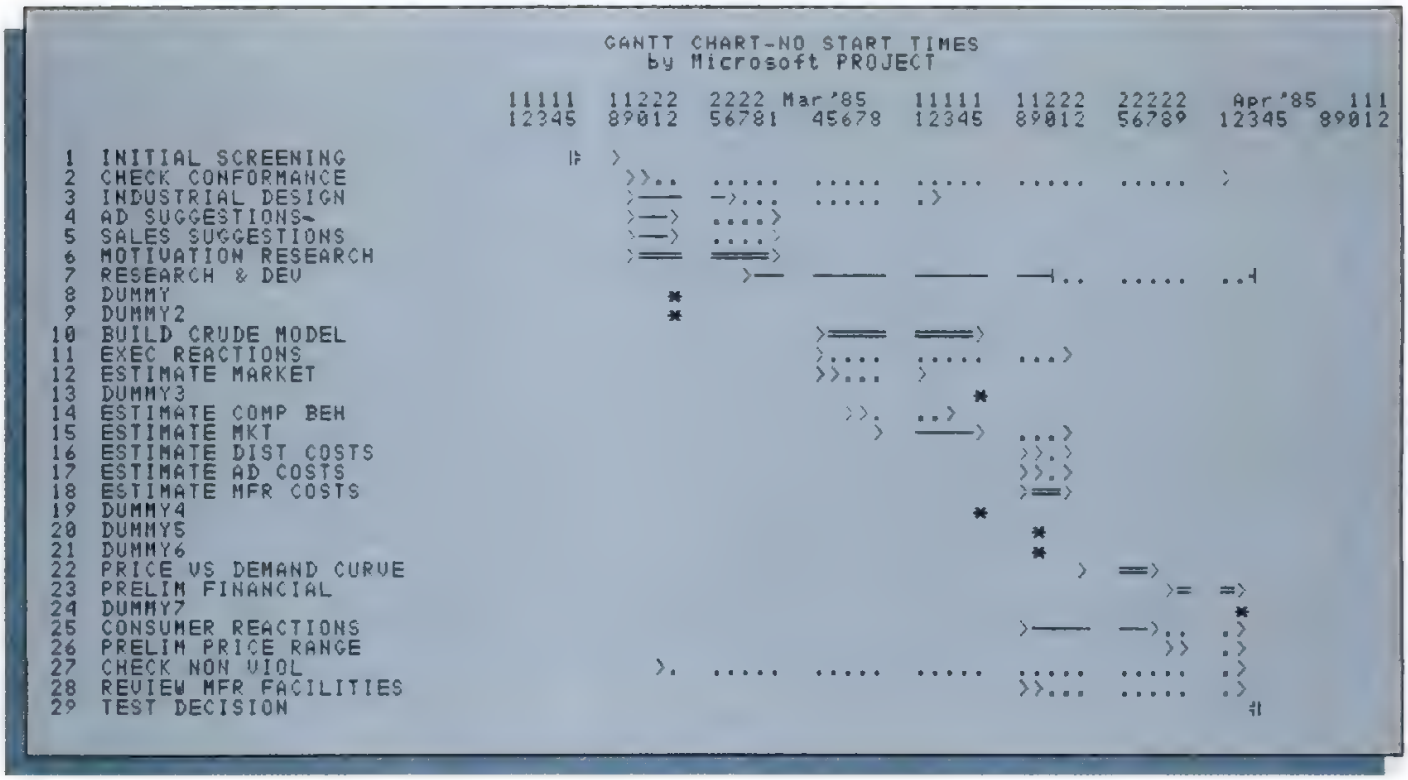
Next you enter each activity, designating the description, the duration, start date, predecessor activities, and resources. While entering resources you can designate each resource's unit cost and the amount of time per day it is available. For instance, a worker might be available only 50 percent of each day and spend only 20 percent of each day on task number 3. *Project* automatically calculates the total amount of time each resource is used and the total cost of each resource.

Project offers a sorting feature that allows you to rearrange activities by how critical they are (critical activities are listed at the top of the schedule), duration, start dates, finish dates, or alphabetically.

Using the XTERNAL command, you can "link" other projects into your current project as subtasks. When a link is defined, the entire external project becomes a single activity in the current project, and the program uses the start date and duration of the external project to calculate a new schedule. This is an extremely useful feature for dealing with large projects. You can construct a common sequence of events once—such as "pour the foundation"—and include it in many projects or at several points in one project. Changes in the "pour the foundation" project file will automatically be reflected in all projects that include that task.

Another of *Project*'s nice features is its histograms, which show the daily amount of time assigned to each resource. You can easily look ahead to find slack time for a resource, and efficiently schedule more work, routine repairs, a major overhaul, or a vacation (depending on the nature and needs of the resource). Histograms can be

● Project's *Gantt chart displays the critical path (==), milestones (*), and slack time (. . .).*



examined quickly and easily on the screen; they print out slowly, and require quite a few pages for each person.

Microsoft Project boasts the use of the Microsoft Mouse. We're mouse fans, but here we found the mouse less convenient than the cursor keys. On most screens the cursor could move only vertically or horizontally so the mouse didn't make it easier to jump from one area to another.

SUMMARY

Every feature included in *Microsoft Project* is well thought out and easy to use. Its weaknesses are simply the features that are not included in this version: it can't graph PERT charts. You can't enter the latest finish or "drop dead" date for a task. You can't enter fixed costs or income for each task.

Then again, no program can have it all. As we gain experience in shopping around for just the right package, we may find ourselves adopting the attitude of a seasoned loan officer looking at commercial loan applications: Flashy, new business ideas—no matter how promising—may be rejected in favor of simpler proposals from firms with a history of quality and service, diverse sources of income, and a team that's already proven itself. By these measures, *Microsoft Project* may be your choice over other packages from new, single-product manufacturers.

At the same time, we ought to check ourselves: Are we acquiring blind prejudices that favor certain manufacturers and ignore others? Are we kidding ourselves by thinking that companies with a longer history will serve us better than ambitious newcomers? Having asked ourselves these questions, we still believe that *Microsoft Project* is the best value for price.

—Diane Burns and S. Venit

MORGAN PATHFINDER: ONE JOB WELL DONE

QUICK INFO

Pathfinder, Version 1.1
Morgan Computing Company, Inc.
10400 North Central
Expressway #210
Dallas, TX 75074
(214) 739-5895
List Price: $80
Requires: 128K RAM, one disk drive.

CIRCLE 790 ON READER SERVICE CARD

In these days of multifunction and multibuck software, it is refreshing to find a program like *Pathfinder* from Morgan Computing Company that does one task well and gives a fast payback. *Pathfinder* may not be glamorous, but it is functional for someone who needs a good Gantt chart and task listing with simple computing and printing equipment.

Pathfinder's competency starts with its clear documentation, which sets you up right away to install and run the program, make changes, and print the reports. To install *Pathfinder* you simply copy two program files from the distribution diskette. Data files then can be stored on either the program diskette or any other system diskette. The program also has a built-in capability to display a directory of its data files on any system disk, a handy feature left out of many more costly programs.

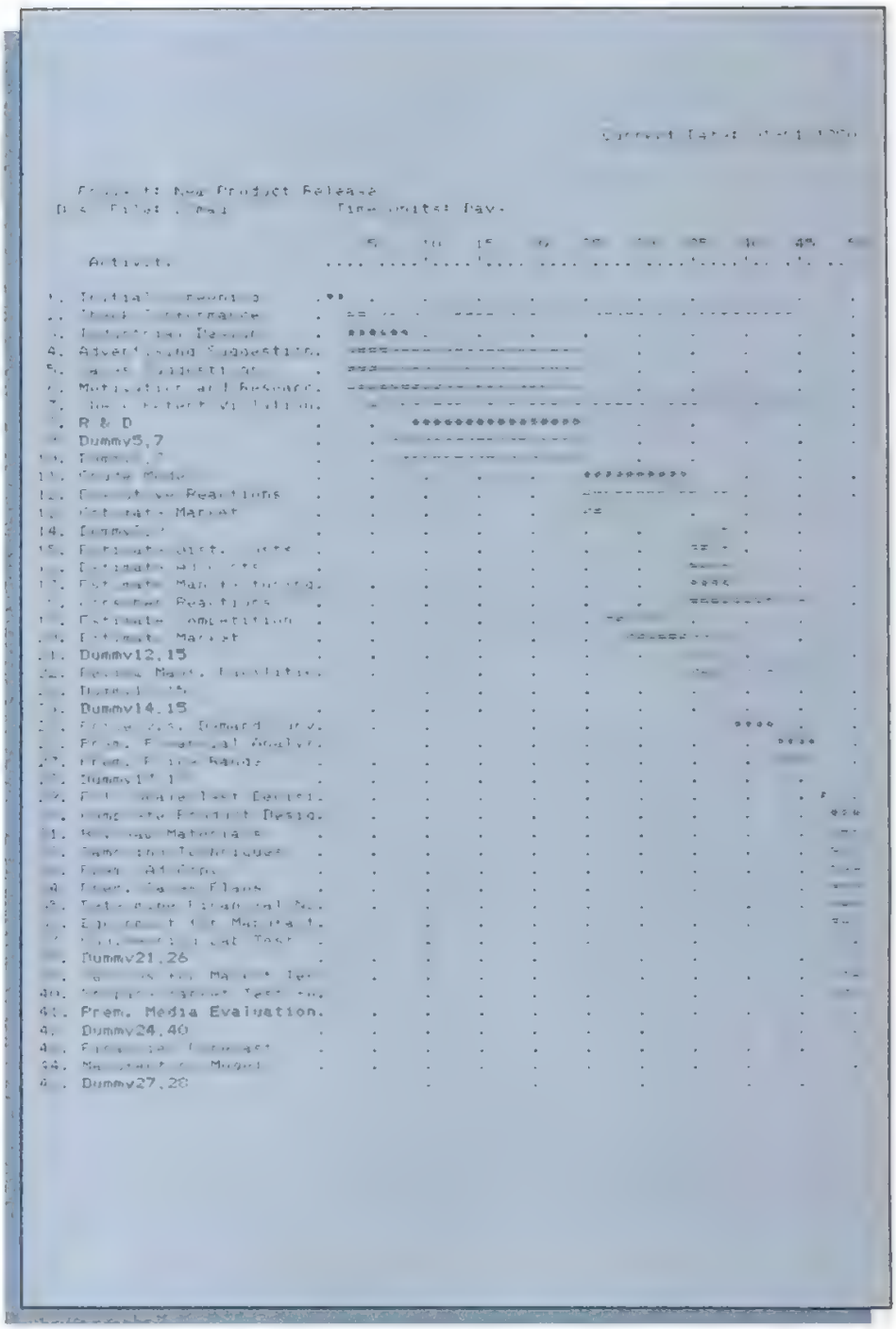
NO EXPLAINING NECESSARY

You'll notice that *Pathfinder* lacks both a tutorial and help screens, but that's no problem as the program doesn't need a lot of explaining. The program accepts only four elements for each task: name, beginning event number, ending event number, and time to perform the activity. It won't

accept dates or even fractional portions of a work time. Nor will it accept holidays or reshuffle the data, but it creates Gantt charts quickly and prints just as fast.

If you buy *Pathfinder*, make sure you get Version 1.2 or a later one as the earlier ones have problems. For example, the first version I reviewed (Version 1.1) had a few irritating traits that showed up during editing. Using this one, I had to press the Enter key to execute some functions and input a single character or a letter to execute others. If you hit the Enter key along with one of the single-key entries, the computer interprets the Enter as the answer to the next question. This could be inconvenient if it happened at the wrong point in the data-entry process. An updated version of the program corrects this situation and several others. If you do have a version of *Pathfinder* older than 1.2, these problems can be corrected with an upgrade that costs $20.

Because of *Pathfinder*'s relative simplicity, entering the *PC Magazine* case study took only 20 minutes. But then I noticed a problem: the program won't accept an unterminated action. It won't run if there is more than one action that doesn't have a continuing connection. This forced me to extend some of the dead-end actions in the case study to some convenient and logical function by creating dummy activities. Extending the actions led me to make eight links. For example, I connected the action called "Determining the Ad Budget" to the one called "Selecting the Media." I also connected "Hiring a Sales Manager" to "Establishing Distribution Channels." When



● *Pathfinder's Gantt chart shows tasks with critical path and slack highlighted over user-defined time units.*

you make the PERT chart, the only allowable unterminated action is the final one.

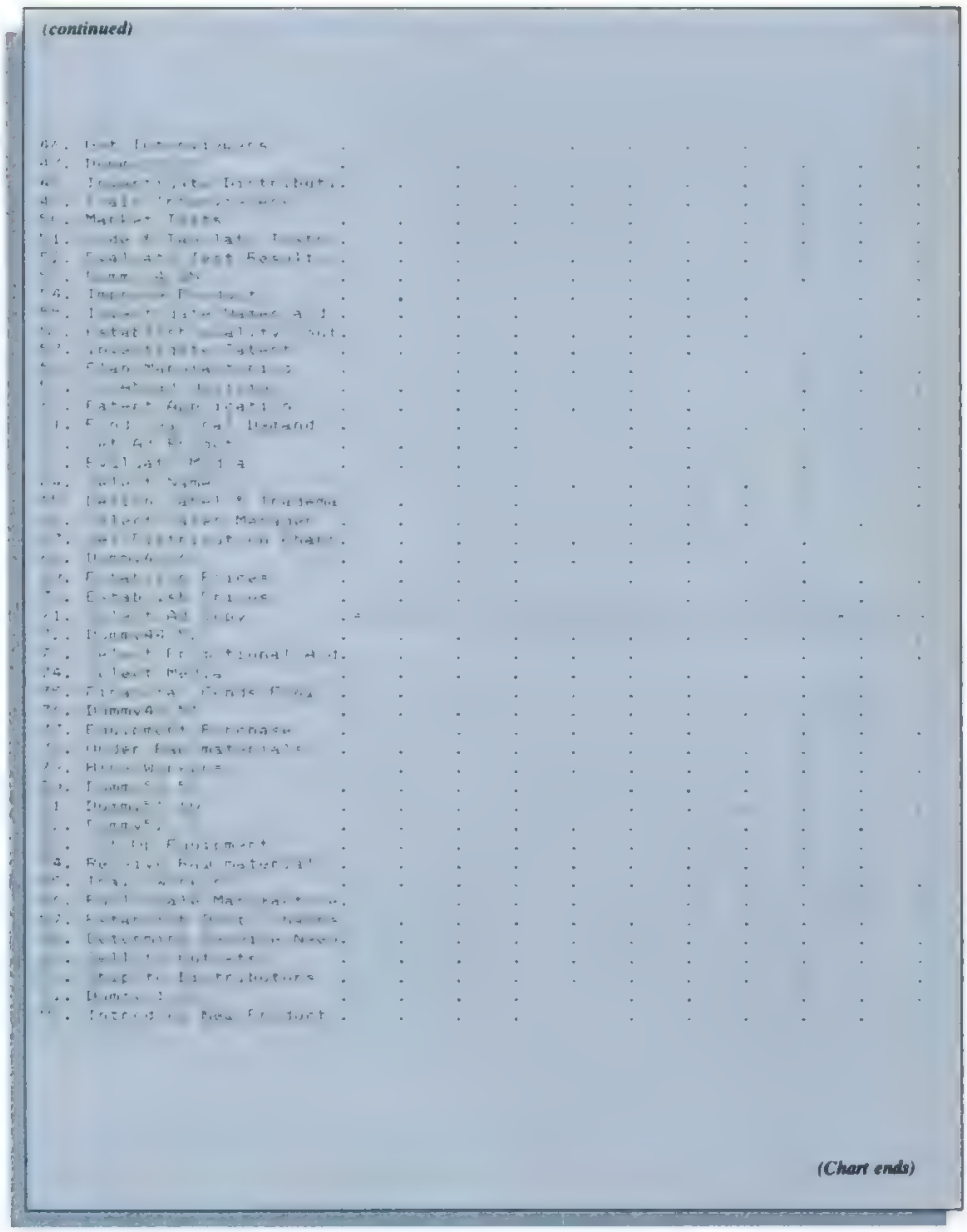
Pathfinder's editing function works smoothly and quickly. Various subelements of any task can be changed or deleted and the entire problem is automatically reordered and rearranged. The data entered into the system are checked for logic, and the error messages are presented in understandable English.

The program uses a simple printer interface, and the Gantt chart it produces could be run on any type of printer, including letter quality machines without graphics. *Pathfinder* produces only event listings and Gantt charts, but the outputs can be directed to either the printer or the screen, and the printer commands are clearly prompted. The *Pathfinder* program comes in versions that print out 80-column or 132-column Gantt charts. You can print files created under one program through the other one. The printed output is not compressed, but the chart itself is broken at the right border. Event names are repeated in the left margin when the next set of timed events is printed. In other words, in the 80-column mode the first printing names all of the events and activities for days 0 through 50. The second chart names all of the events and the activities for days 50 through 100. This printing method eliminates the need to cut and paste charts.

Pathfinder is not tailored to the IBM PC keyboard. It probably would run well in any MS-DOS hardware that can read the PC-DOS format. You can run it from a hard disk because it is not copy protected, but you wouldn't gain anything in performance since all the executing program and the data are contained in RAM.

Pathfinder is an honest and fast $80 program that creates and prints Gantt charts well. If this is all you need, you shouldn't pay for more elaborate programs. *Pathfinder*'s capabilities are light-years ahead of the pencils and T-squares many of us still use for producing charts. I know that around my office, *Pathfinder* could pay for itself very quickly.

—Frank J. Derfler, Jr.



In the 92 seconds it find any file you need

Ampex 20 MB hard disk with 25 MB tape backup.

*IBM-PC is registered trademark of IBM. *Apple II and IIe are registered trademarks of Apple Computer. *PC

takes to read this ad, on our backup streamer.

In the 1 hour, 4 minutes other streamers take, you could call your broker. Linger over coffee. Wade through the Wall Street Journal. And read this PC Megastore ad too. So take the time. You'll more than make it up with a PC Megastore hard disk and tape hooked to your IBM-PC® or compatible, Apple II or IIe,® because all the files you need–both current and archive–will always be right where you need them. Just a keystroke away. The secret? Only Ampex backs up a 20 MB hard disk with another 25 megabytes* of addressable storage–a unique, bootable streamer with cache memory. That not only means you can address a file in 92 seconds, you can backup files offline just by touching a couple of buttons. Without tying up your computer. Your time. Or a small fortune in floppies. (In fact, our 45 megabytes of available storage cost about half the price per MB of other hard disks.) So consider your time, money and convenience. And our quality. PC Megastore is backed by a full year warranty from Ampex, a company known for manufacturing quality computer peripherals for over 20 years. Take a moment to call us at 800 421-6863, or 213 640-0150 in California. Or write: Ampex Computer Products Division, 200 N. Nash St. MS M-11, El Segundo, CA 90215. We'll give you a dealer's name so you can buy PC Megastore. Then in no time at all, you'll make up for the 92 seconds you spent reading this ad.

AMPEX

Ampex Corporation • One of The Signal Companies

Megastore is upgradeable and comes in four models: 20 MB with 25 MB tape, 10 or 20 MB disk, or 25 MB tape.

CIRCLE 110 ON READER SERVICE CARD

PERTMASTER: A WORKHORSE OF A PROGRAM

PC FACT FILE

PertMaster, Version 4.6
Westminster Software Inc.
3000 Sand Hill Rd.
Bldg. 4, #242
Menlo Park, CA 94025
(415) 845-1400
List Price: $695/1500 tasks, $895/2500 tasks.
Requires: 128K RAM, two double-sided disk drives, DOS.

CIRCLE 780 ON READER SERVICE CARD

PertMaster, from Westminster Software Incorporated, is a thoughtfully crafted product fully suited for medium to large planning efforts. Indeed, for its $650 price tag, this highly flexible product has a lot going for it.

PertMaster runs under CP/M with a minimum of 56K RAM or PC/MS-DOS with at least 128K RAM. It requires one disk drive, but Westminster Software suggests two disk drives and recommends a hard disk for large projects. *PertMaster* provides direct support for the IBM PC-XT, Compaq, GRID Compass, Sirius/Victor, and Eagle PC 16-bit models.

Moreover, *PertMaster* allows up to 1,500 activities per project and 29 resources per activity for a 16-bit machine with 256K RAM. An optional version for $895 supports 2,500 activities.

5-MINUTE INSTALLATION

PertMaster installation takes less than 5 minutes. The system's programs and files come on two disks. To get them up and running, I had only to copy the contents of these publisher-supplied disks to my 20-meg hard drive.

Westminster Software uses the common protection scheme, which requires that a factory-supplied disk be available in the A: drive whenever the program is initiated. I believe this system reduces the value of the product because it forces you to swap diskettes—a waste of time for hard-drive users.

Westminster provides a small but well-executed documentation manual for *PertMaster*. The 140-page manual is bound in an IBM format, three-ring binder. It offers a solid tutorial and a good reference section. The only poor grade I give this documentation is for its skimpy error-handling section. However, Westminster promises a major revision of *PertMaster*'s manual by mid-fall.

SPECIAL FEATURES

By the time I tackled *PertMaster*, I had already reviewed three other planning programs that were similar to it in scope and complexity. Therefore, I was beginning to establish enough experience with project-planning-type packages to appreciate some of *PertMaster*'s really nice features.

For example, *PertMaster* allows you to create an unlimited number of calendars with various workday, holiday, and shift-work situations. Any of these calendars can be used with any job. And I was particularly impressed with the calendar editing feature, which enables you to use wild cards to enter repetitive holidays in a 10-year calendar with a single set of keystrokes. For example, you can enter "25 December XX," and the program will automatically assign a Christmas holiday for each year of your project.

PertMaster does not limit holidays or the number of odd and complex working schedules, such as half-days and shifts, that you can create. *(continued)*

● PertMaster *lists tasks on the Gantt chart by their start and end nodes.*

```
PC Magazine Test
     REPORT TYPE :PERIOD BARCHART                                    PRINTING SEQUENCE  :Earliest Activities First
                                                                     SELECTION CRITERIA :ALL
     PLAN I.D.   :PCTEST   VERSION  13                               TIME NOW DATE      : 2/JAN/84
=========================================1984=========================================================================
   PERIOD COMMENCING DATE              '2    '9    '16   '23   '30   '6    '13   '20'23'27   5    '12   '19   '26   '2    '
   MONTH                               'JAN  '     '     !     !     !FEB  !     '  !  !     'MAR  !     !     !     'APR  '
   PERIOD COMMENCING TIME UNIT         '1    '6     11   '16   !21   !26   !31   !36'38'40   '45   !50   !55   !60   '65   '
=================================================================================================================================
  1-   2 Initial screening             '     '     '    C!    !     !     !     ! ! !  .  !     !     !     !     '     '
  2-   4 Industrial Design            '           '    C!    !     !     !     ! ! !     !     !     !     !     '     '
  2-   7 Motovational research        '     '     '    =!=.  '     !     !     ! ! !     !     !     !     !     '     '
  2-   5 Advertising Suggestions            '     '    =!..  '     '     '     ' ' '     '     '     '     '     '     '
---------------------------------------------------------------------------------------------------------------------------
  2-   6 Sales Suggestions            '     '     '    =!..  '     '     '     ' ' '     '     '     '     '     '     '
  2-   3 Check Prodt Conformance      '     '     '    =!.....'     '     '     ' ' '     '     '     '     '     '     '
  2-  18 Check Prodt Patent Situation '     '          =!.....'     '     '     ' ' '     '     '     '     '     '     '
  4-   7 R&D on Model                       '     '     'CC   !     !     !     ! ! !     !     !     !     !     '     '
---------------------------------------------------------------------------------------------------------------------------
  7-   8 Build Crude Model            '     '     '    !  CC !     '     '     ! ! !     '     !     !     !     '     '
  7-  10 Estimate Markets             '     '          !  C  !     !     !     ! ! !     '     !     !     !     '     '
  7-   9 Executive Reactions          '     '     '    '  =. !     '     '     ' ' '     '     '     '     '     '     '
 10-  11 Estimate Competive Behavior  '           '    !  C  !     '     !     ! ! !     '     !     !     !     '     '
---------------------------------------------------------------------------------------------------------------------------
 11-  12 Estimate Market Potential          '     '    '  CC !     '     '     ' ' '     '     '     '     '     '     '
  8-  15 Estimate Manufacturing Costs '     '     '    !   C !     !     !     ! ! !     !     !     !     !     '     '
  8-  14 Estimate Advertising Costs   '     '     '    !   C !     !     !     ! ! !     !     !     !     '     '     '
  8-  13 Estimate Distribution costs  '     '     '    !   C !     !     !     ! ! !     !     !     !     !     '     '
---------------------------------------------------------------------------------------------------------------------------
  9-  18 Consumer reactions           '           '    '   CC!    !     !     ! ! !     !     !     !     !     '     '
 12-  18 Review Manufacturing Facilitie '           '    '   =.'    '     '     ' ' '     '     '     '     '     '     '
 15-  16 Price .s. Demand Curve      '     '     '    !   CC!    !     !     ! ! !     !     !     !     !     '     '
 16-  17 Prelim Financial analysis   '           '    '    C'    '     '     ' ' '     '     '     '     '     '     '
---------------------------------------------------------------------------------------------------------------------------
 16-  18 Preliminary Price Range           '     '    !   C!    !     !     ! ! !     !     !     !     !     '     '
 13-  19 Full scale Test Decision    '     '     '    !   C!    !     !     ' ' '     '     '     '     '     '     '
 19-  20 Complete Product Design     '           '    !   C!C   !     !     ! ! !     !     !     !     !     '     '
 19-  26 Equipment for Manufacturing Ne '     '     '    '   C'CC  !     !     ! ! !     !     !     !     !     '     '
---------------------------------------------------------------------------------------------------------------------------
 19-  22 Sampling Techniques         '     '          '   =!..  '     '     ' ' '     '     '     '     '     '     '
 19-  21 Buy Raw Materials           '     '     '    '   =!..  '     '     ' ' '     '     '     '     '     '     '
 19-  23 Preliminary Advertising Copy '     '     '    '   =!=..  '     '     ' ' '     '     '     '     '     '     '
 19-  25 Determine Financial Needs   '     '     '    '   =!=....!...  '     ' ' '     '     '     '     '     '     '
---------------------------------------------------------------------------------------------------------------------------
 Barchart Key:-  CCC :Critical Activities  === :Non Critical Activities   NNN :Activity with neg float   ... :Float
```

You can set up a project using either the arrow or precedence method. With the arrow method, or Gantt chart, a task exists on a line between nodes. In the precedence method, or PERT chart, jobs exist on the nodes and are connected by arrows. Using the arrow method, I was able to enter the PC case study in 30 minutes—about half the time required in other programs.

WITH THE ARROW METHOD, OR GANTT CHART, A TASK EXISTS ON A LINE BETWEEN NODES. IN THE PRECEDENCE METHOD, OR PERT CHART, THE JOBS EXIST ON NODES AND CONNECT BY ARROWS.

PertMaster supports two type-ahead modes: normal and executive. These can be used by a fast typist or—better yet—by a slow typist with *ProKey*, by RoseSoft Inc., to make task input even quicker.

PertMaster makes use of function keys and always provides a function key menu at the bottom of the active page.

Another nice feature is *PertMaster*'s abbreviation library. You can establish your own abbreviations for tasks and resources, and once you enter them in the library, they will be recognized by *PertMaster* anywhere in the program.

STANDARD REPORTS

PertMaster's standard reports include the following: project bar chart, period bar chart, activities sorted by early start, float, description or activity number, user-defined selective reports on activity type or resource used, resource requirements in tabular form, resource requirements in histogram form, cash-flow requirements for multiple cash categories, logic reports, working-day calendar report, user abbreviations report, and an on-screen reporting facility.

The program offers highly flexible time periods, allowing tasks to be timed in seconds, minutes, hours, days, shifts, weeks, months, years, or as a unit of completed work periods when several projects are merged.

To add a task, you insert the project, its description, and relationships to existing tasks. And to delete an existing task, you erase the task and manually reconstruct the relationships among the remaining tasks.

NEGATIVE ASPECTS

On the down side, this otherwise excellent package seems to have a serious problem with error trapping—at least in Version 4.6, which I reviewed. The program bombed out several times by announcing that an "out of string space" error had occurred.

The technical folks at Westminster admitted that they had seen the error before, that it had nothing to do with string space, and that it could sometimes be fixed by recopying both of the program disks to the active disks. When this failed, I ultimately tracked the error to the program's inability to deal with a task that erroneously connected an existing node to a nonexistent node, which appeared after the formal finish of the task.

Westminster told me that the system should detect such errors in logic and simply warn you that the error had occurred. In my case, the system took a walk, and there was no clear explanation for the response.

Westminster immediately supplied me with a second system, which worked flawlessly. *PertMaster* currently supports most standard printers and gives you the opportunity to choose colors for various operating modes.

A NEW MID-FALL RELEASE

A *PertMaster* version to be released this fall is said to support plotters and contain an integrated database to facilitate manipulation of task-related financial information.

The current version allows planning data to be dumped in ASCII format for transfer to spreadsheets or word processors.

Overall, I like *PertMaster*. Error trapping withstanding, the system is professionally implemented with the user in mind. Compared with the other packages I have reviewed, *PertMaster* ranks high on the feature-versus-price scale. *PertMaster* should be a good buy—especially the upcoming version, which promises plotter support, better documentation, and improved error handling. **—Dick Aarons**

COMPARED WITH OTHER PACKAGES, PERTMASTER RANKS HIGH ON THE FEATURE-VERSUS-PRICE SCALE. PERTMASTER SHOULD BE A GOOD BUY—ESPECIALLY THE UPCOMING VERSION.

PRO-JECT 6: LITTLE DETAILS COUNT

PC FACT FILE

PRO-JECT 6
SoftCorp, Inc.
2340 State Rd. 580, #244
Clearwater, FL 33575
(813) 799-3984
List Price: $199, 250-task version; $149, 150-task version; $99, 75-task version.
Requires: 128K RAM, two disk drives, DOS 1.1 or 2.x.

CIRCLE 788 ON READER SERVICE CARD

PRO-JECT 6 is a bargain-priced product that offers many impressive features such as speed, report flexibility, and a large variety of print options. However, a number of irritating details make it unpleasant to use. If you can tolerate its shortcomings, it may be worth consideration.

Installation is a snap. The documentation clearly explains the process, and a screen print shows you the default values. It took me just a minute to make a few changes and scan the remaining defaults to see they were correct, and that was it.

PRO-JECT 6's tutorial walks you through all the different features and quickly teaches you how to set up projects and produce reports. A sample file shows you exactly what a project looks like. And since the tutorial is keyed to this sample, you can work with a complete project without having to key in all the tasks. The exercises were clear and helpful; I finished in half an hour.

DOCUMENTATION

The manual was apparently produced with a daisywheel printer and then its pages were reduced for offset printing. The only graphic elements are daisywheel screen prints, so the manual's pages are plain and covered with small type.

The writing is clear and concise. It omits a few important points, such as the restriction of dates to between 1980 and 1989, but it has a brief command reference section, a list of error messages, and appendixes with sample reports and tips on using the package with other programs. An index would be helpful; "Appendix E," on "Optional Shared Disk Support," was missing from my review copy.

THE CASE STUDY

Once I began running the case study, the problems began to accumulate. Data entry is easy and quick, but you must issue the ADD command for each task. You cannot simply enter an Add mode and then add one task after another.

PRO-JECT 6's nonstandard use of the Tab key—to advance from field to field while entering data—irritated me. Moreover, the Enter key is used to signal the end of a task entry, so if you hit it by accident—and you will hit it—you must go back and edit the task using the CHANGE command.

The original data for this project called for it to begin in 1968. After I put the first task in, an error message announced that the program only recognized dates from 1980 through 1989. The manual does not mention this important fact. I then translated the dates to 1988, but after entering 15 tasks, I realized that I would soon hit 1990, and, once again, my schedule would not be accepted.

I started over (after having wasted half an hour of data entry) using a newer set of test data ranging from 1985 to 1987. After the twenty-ninth task, a new error message

"MY OWN RAGS TO RICHES STORY" CHAPTER 1

(Your picture here)

How *jr* Computerized the Books and I Saved $2,000

by _____
(Your name here)

I was an _____ (established, industrious, entrepreneurial) business person, looking for an escape from bookkeeping drudgery. But the computer "solutions" I'd seen all seemed too _____. (expensive, complex, intimidating)

Then the local computer dealer called and said "Try Rags to Riches.™ It was made for you."

So I did. The price was right. So was the price of the PC*jr* computer* it ran on. The whole system cost $2,000 less than others I'd seen.

And it was so easy to use! No codes or names to type—just pre-assigned customer and vendor keys. Five basic commands ran all the modules I needed: _____. (Ledger, Sales, Payables, Receivables, *all of them*)

They work together, and all fit on one disk. The dealer said I'd save another bundle because I didn't need _____. (two disk drives, a consultant to set it up, a training course, *all the above*)

The clincher was the way it's customized to suit my business. There are even Rags to Riches Solution Booklets™ to help make the most of my investment.

Rags to Riches is the only "RAM-based" accounting software. It calculates instantly—no waiting. Its "Open Architecture," means the data works with hundreds of other programs, so I won't outgrow it.

Now, it's business as usual, only better. I actually have extra time to _____. (work on increasing profits, drum up more sales, relax)

And, of course, to tell my friends that success doesn't have to be difficult anymore. (To be continued.)

*Also for the IBM® PC and compatibles.

Chang Labs™

The family of software solutions

For the nearest dealer, call (800) 972-8800
In California, (800) 831-8080

Headquarters, 5300 Stevens Creek Boulevard, San Jose, CA 95129
International Distribution: United Kingdom: Vector House, Phone 01-943 1257 Belgium: Vector International, Phone 32 (16) 202496
Japan: Software International, Phone 03 486-7151 © 1984 Chang Labs IBM® is a registered trademark of International Business Machines.

CIRCLE 238 ON READER SERVICE CARD

Command/Assist™

YOUR DOS MANUAL ON DISK

THERE WHEN YOU NEED IT!

$49.95

AVAILABLE ONLY FOR IBM PC, XT AND COMPATIBLES USING PC/MS DOS 2.0 or GREATER

NOW TAKE COMMAND OF YOUR DOS

Now your **DOS** manual is available on disk! Think of it, no more searching or fumbling through hundreds of pages to find the command you need. Suppose you want to know how to use a **DOS** command, just type **HELP** and the command name. In the blink of an eye the information is on your screen, full instructions on how to properly use the command, complete with examples. Suppose you can't remember the command you want, just type **HELP** and all the commands are displayed on the screen in alphabetic order. Command/Assist gives you the ability to create custom help displays.

NOW YOU CAN TAKE COMMAND.

Micro Design International Inc.
6566 University Blvd., Winter Park, Fl 32792 • (305) 657-6604

Outside U.S. add $15.00 (Payment must be a bank draft payable in U.S. dollars.)

IBM, IBM PC, XT and PC DOS are registered trade marks of INTERNATIONAL BUSINESS MACHINE CORP. MS DOS, a registered trade mark of MICROSOFT CORP.

CIRCLE 167 ON READER SERVICE CARD

ORDER YOUR COPY OF **Command/Assist** TODAY!
For Visa and MasterCard orders call:
TOLL FREE 800-221-6444 Ext. 800
(OUR LINES ARE OPEN ANY TIME DAY OR NIGHT).

Dealer and Distributor inquiries welcome. Call **TOLL FREE 800-327-1056 Ext. 5118/IN FLORIDA 800-432-8515 Ext. 5118**
Another quality product from **MICRO DESIGN INTERNATIONAL** your internal Hard Disk solution.

Command/Assist $49.95 Plus $5.00 shipping and handling.
COD orders add an additional $2.50.
Certified Check M/O
MC/ VISA/ #
Expires / /

Name
Address
City
State/Zip

BASF QUALIMETRIC™ FLEXYDISKS®. A GUARANTEED LIFETIME OF OUTSTANDING PERFORMANCE.

BASF Qualimetric FlexyDisks feature a unique lifetime warranty, firm assurance that the vital information you enter on BASF FlexyDisks today will be secure and unchanged tomorrow. Key to this extraordinary warranted performance is the BASF Qualimetric standard... a totally new set of criteria against which all other magnetic media will be judged.*

You can count on BASF FlexyDisks because the Qualimetric standard reflects a continuing BASF commitment to perfection in magnetic media. One example is the unique two-piece liner in our FlexyDisk jacket. This BASF feature traps damaging debris away from the disk's surface and creates extra space in the head access area for optimum media-head alignment. The result is a guaranteed lifetime of outstanding performance.

For information security that bridges the gap between today and tomorrow, look for the distinctive BASF package with the Qualimetric seal. Call 800-343-4600 for the name of your nearest supplier.

Visit BASF at Comdex Fall, Booth 1372

CIRCLE 139 ON READER SERVICE CARD

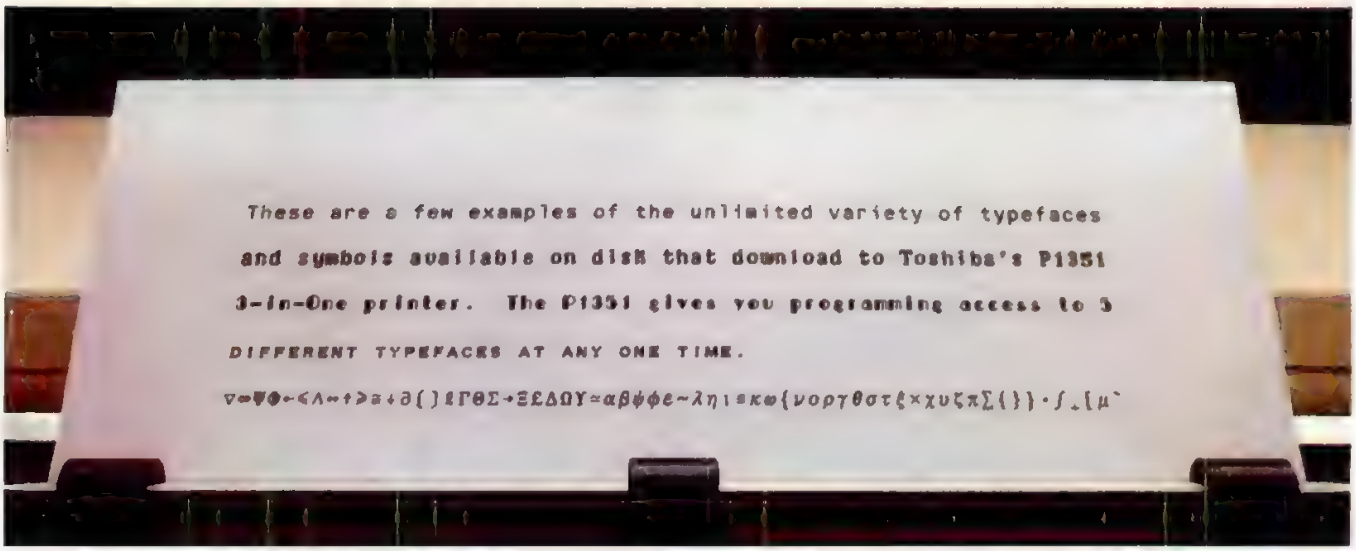
**Contact BASF for warranty details.*

ENTER TOMORROW ON BASF TODAY.

BASF

© 1983 BASF Systems Corp., Bedford, MA

Copyrighted material



The first 3-in-One printer smart enough to change typefaces automatically. The Toshiba P1351.

The Toshiba P1351 is the ultimate 3-in-One printer. Others come close to us on speed. Others try to approach our level of graphics sophistication. And there are even a couple of printers with a 24-pin dot matrix print head similar to ours. But no other printer has it all.

Because Toshiba has always pioneered in printer development and technology. Where we have led, others have followed. And now we've added the benefit of software-selectable downloadable typefaces.

Smart and unlimited. The Toshiba P1351 does more than give you access to three resident typefaces. It also gives you the ability to download an unlimited variety from a growing library of IBM-compatible software typefaces. They're all stored on floppy disk. And you get programming access to five typefaces at any time.

Smart and letter-perfect. Our unique high-density 24-pin dot matrix print head gives you letter-quality results from any typeface you choose. And with Qume SPRINT 5™ emulation, the Toshiba P1351 can give you those results from almost every popular word processing program.

Of course, it's fully IBM-compatible. And there's even an optional forms tractor or sheet feeder for paper handling versatility.

Smart and fast. Why sacrifice speed for letter-quality printing? The Toshiba P1351 gives you the best of both worlds. Sharp, clean letter copy at 100 cps. And even faster draft copy at 192 cps.

Smart and an eye for detail. The P1351's print head doesn't just produce letter-quality type. At 180 x 180 dots per square inch, its high-resolution graphics lead the industry. And it's supported on popular graphics software like Lotus 1-2-3.™

Smart and reliable. The Toshiba P1351 is designed and built with a very intelligent attitude toward reliability. And optional third-party 24-hour service is also available. That's why, over the past four years, more than 200,000 smart buyers have depended on Toshiba 24-pin printers for letter-quality results.

So make the smart move. To the Toshiba P1351 3-in-One™ printer. For more information, call 1-800-457-7777, Operator 32.

Lotus and 1-2-3 are trademarks of Lotus Development Corporation. SPRINT 5 is a trademark of Qume Corporation.

In Touch with Tomorrow

TOSHIBA

TOSHIBA AMERICA, INC., Information Systems Division

CIRCLE 462 ON READER SERVICE CARD

appeared: "Project length is now greater than 300 periods—make it shorter." I later found this limitation mentioned in some of the sales literature but did not find it in the manual. I attempted to mend matters by removing the start dates from the tasks, but the program would not allow it.

By this time, I had wasted nearly 1½ hours, and I still had not learned to use the Tab key instead of the Enter key. I started over one more time, leaving out the start dates. This time I successfully entered the entire project. The only hitch came at the end of the sample data, which includes two ½-day-long tasks. *PRO-JECT 6* accepts only integer durations, from 0 to 99. I substituted a 1 for .5 in each case. Not counting the false starts, it took just under an hour to enter all the tasks.

The data entry was a little more difficult because the sample data was presented in terms of start and end nodes for each task. *PRO-JECT 6* prefers to describe task relationships in terms of "dependencies," so you must list the tasks that must be completed before the current task may start. *PRO-JECT 6* also assigns a number to each task, so I had to use these instead

● PRO-JECT/6's *Gantt chart can show task dependencies and completed tasks in addition to the critical path, float, and milestones.*

```
                                   PC Magazine, Project Management Systems                          Frame: 1
08-14-1984  00:37:24                   PC Magazine Gantt Chart Sample                               Page: 1

     Name Of Project:   PC Magazine: Project Management Systems
      Project Leader:   Ken Edwards


                                       FEB85                       MAR
Task Ref                               15 18 19 20 21 22 25 26 27 28 01 04 05 06 07 08 11 12 13 14 15 18 19 20 21 22 25
No.  Code Description                   1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

  1  A    Initial Screening           1 S=====> . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
  2  B    Check Product Conformance   2 . . <=====> . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
  3  M    Industrial Design           3 . . . . <=================> . . . . . . . . . . . . . . . . . . . . . . . . .
  4  N    Advertising Suggestions     4 . . . . <----------->.......................................................>
  5  Q    Sales Suggestions           5 . . . . <----------->.......................................................>
  6  L    Motivational Research       6 . . . . <--------------------------->.......................................>
  7  B    Res & Develop on Model      7 . . . . . . . . . . . . <==============================================>
  8  M    Build Crude Model           8 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . <=
  9  A    Executive Reactions         9 . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . <-
 10  A    Estimate Market Characteristic 10. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . <=
 11  A    Estimate Competitive Behavior 11. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 12  A    Estimate Market Potential   12. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 13  A    Estimate Distribution Costs 13. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
 14  N    Estimate Advertising Costs  14. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .

 Symbol Legend:

 ===  CRITICAL TASK       <  Task Has Dependencies
 ---  Non-Critical Task   >  Task Has Successors
 ...  Float Time          S  Task Has No Dependencies
 :::  Completed Task      X  Task Has No Successors
 *    Project Milestone   +  Current Run Date
```

of the task labels provided in the sample data. As a result, I had to translate the data before I could enter it.

When I printed the reports, the critical tasks were all correctly identified; however, a number of noncritical tasks were incorrectly marked as critical. I double-checked the Gantt chart but could find no reason for these spurious results. The reports were complete and flexible, but, even using the compressed font on an Epson printer, it took nearly 12 minutes to print the six pages of the Gantt chart.

I deleted a task (number 15) as required by the sample task, and *PRO-JECT 6* instantly adjusted the critical path calculations. When I went to reinsert the task using the same task number, I was given an error message for my troubles. I then added the task at the end of the list, moved it to its proper place, and checked the results. The critical path had not reverted to the previous result. To my dismay, I found out that *PRO-JECT 6* deletes all references to the deleted task in other tasks as well. I had to go back and edit the task that had listed number 15 as a dependency before the critical path was restored.

SPECIAL FEATURES

PRO-JECT 6 has a tremendous printing facility. In essence, it has one large menu of print options, from which you assemble the information you want included in a given report. For example, you can print the task description, status, duration, late finish date, and total cost, all sorted by status and subsorted by finish date. You can force new pages every time a data element changes. If, for example, you sort on Reference (which could be used to mark responsibility) and late start date and you force new pages for each new reference, you can produce separate reports for each person in the project.

You may set up files of preformatted report definitions. You may also route the results to the screen, printer, or disk file There are even facilities to prepare the results for use with *SIDEWAYS*, *1-2-3*, and *WordStar*. Furthermore, you can define your own output profiles to make use of different printer features.

In addition to the data entry problems I have described, *PRO-JECT 6* has other rough edges, such as inconsistent formats for entering dates (sometimes MMDD-YY, other times MM/DD/YY). For example, the Enter key or Tab key is often required to advance to the next field, and sometimes the cursor will move ahead on its own after you enter the data.

Moreover, each time you enter the project maintenance or report sections, you must wait 30 seconds to 1 minute while it "creates a project calendar"—even if the project file is empty. You are asked to specify an output device when creating a report profile, but this instruction is then ignored when you ask to print the report, and you must make the choice again. **—Alfred Poor**

PROJECT MANAGEMENT: MODEST CLAIMS

PC FACT FILE

Project Management
IIE Microsoftware
Institute of Industrial Engineers
25 Technology Park
Norcross, GA 30092
(404) 449-0460
List Price: $140, IIE members; $170, nonmembers.
Requires: 64K RAM, one disk drive.

CIRCLE 737 ON READER SERVICE CARD

Project Management offers four separate programs for simple, preliminary analysis of projects. It is an inexpensive package, written in unprotected, interpreted BASIC and designed for simple applications. The package doesn't produce fancy charts and graphs, but it does perform useful network analysis. *PM* makes only modest claims and fulfills them all.

PM was written for members of the Institute of Industrial Engineers, so its manual assumes some familiarity with both project management and microcomputers. For example, it never reminds you to make a backup copy of the program disk. Fortunately, *PM* is a snap to use.

A NEW PLUS★WARE™ PRODUCT

Pocket APL™

Your personal introduction to the powerful APL Programming Language—for only $95!

Much faster to program than BASIC or FORTRAN. Able to execute multiple tasks in a single line. More powerful than other programming languages.

It's an extraordinary programming language called Pocket APL!

Whether your application requirements are in math, business, science, or engineering, Pocket APL can help you be more productive. You save time—Pocket APL's efficiency and simplicity allows you to develop programs four to ten times faster than with conventional languages. And, as a powerful online calculator, Pocket APL is invaluable for quick number-crunching and analyses.

Best of all, Pocket APL is easy to learn and fun to use. And for only $95, you benefit from the same powerful capabilities of STSC's premiere APL★PLUS®/PC System which *PC Magazine* calls a "major accomplishment that may influence the future of microcomputing."

Join the rapidly growing community of satisfied users who enjoy the pleasures, power, and advantages of the APL Programming Language. Order your copy of Pocket APL today. Call (800) 592-0050. In Maryland, call (301) 984-5123. All major credit cards accepted.

System requirements Minimum 128K of memory IBM Personal Computer, IBM PCjr., and true compatibles equipped with PC DOS or MS DOS operating systems. Pocket APL uses a soft character set for computers with graphics board or color monitor; keywords for computers with monochrome

STSC
A Contel Company
STSC, Inc., 2115 East Jefferson Street, Rockville, Maryland 20852

PLUS★WARE and Pocket APL are trademarks of STSC, Inc APL★PLUS is a service mark and trademark of STSC, Inc., registered in the United States Patent and Trademark Office and in certain other countries

CIRCLE 431 ON READER SERVICE CARD

LAST NIGHT, 39 MUSICIANS HAD A COMPUSERVE CONFERENCE, SO DID 31 M.D.S, 49 SPORTS FANS AND 640 APPLE POLISHERS, AND NO ONE HAD TO LEAVE HOME.

The Electronic Forum, Cheaper than Long Distance and Much More Rewarding.

Every night on the CompuServe Information Service, professional and social groups discuss a wide range of subjects. From what's new in medical technology to what's nouvelle in continental cuisine.

And every day more computer owners who share a common interest are discovering this exciting new way to exchange ideas and even transfer hard copy data.

And besides electronic forums, they leave messages for each other on our national bulletin board, "talk" informally on our CB simulator, and communicate via CompuServe's electronic mail.

But best of all, in most cases, CompuServe subscribers get all of these state of the art communications options, plus a world of on-line information and entertainment for the cost of a local phone call plus connect time.

To become part of this flexible communications network, all you need is a computer, a modem and CompuServe. CompuServe connects with almost any personal computer, terminal, or communicating word processor.

To buy a Starter Kit, see your nearest computer dealer. To receive our informative brochure or to order direct, call or write:

CompuServe

Consumer Information Service P.O. Box 20212
5000 Arlington Centre Blvd. Columbus, OH 43220

800-848-8199

In Ohio call 614 457 0802

An H&R Block Company

CIRCLE 226 ON READER SERVICE CARD

CRITICAL PATH ANALYSIS

FROM NODE	TO NODE	EARLIEST START	EARLIEST FINISH	LATEST START	LATEST FINISH	TOTAL FLOAT	FREE FLOAT	CRITICAL PATH
1	2	0	2	0	2	0	0	***
2	3	2	4	43	45	41	0	
2	4	2	8	2	8	0	0	***
2	5	2	6	20	24	18	0	
2	6	2	6	20	24	18	0	
2	7	2	11	15	24	13	13	
3	18	4	5	45	46	41	41	
4	7	8	24	8	24	0	0	***
5	7	6	6	24	24	18	18	
6	7	6	6	24	24	18	18	
7	9	24	25	37	38	13	9	
7	10	24	26	28	30	4	0	
7	8	24	34	24	34	0	0	***
8	13	34	36	36	38	2	0	
8	14	34	36	36	38	2	0	
8	15	34	38	34	38	0	0	***
8	9	34	34	38	38	4	0	
9	18	34	42	38	46	4	4	
10	11	26	28	30	32	4	0	
11	12	28	34	32	38	4	0	
12	15	34	34	38	38	4	4	
12	18	34	36	44	46	10	10	
13	15	36	36	38	38	2	2	
14	15	36	36	38	38	2	2	
15	16	38	42	38	42	0	0	***
16	18	42	44	44	46	2	2	
16	17	42	46	42	46	0	0	***
17	18	46	46	46	46	0	0	***
18	19	46	47	46	47	0	0	***
19	20	47	56	47	56	0	0	***
19	21	47	48	63	64	16	0	
19	22	47	48	63	64	16	0	
19	23	47	53	64	70	17	0	
19	24	47	51	133.5				
					137.5	86.5	2	
19	25	47	49	106	108	59	0	
19	26	47	63	48	64	1	1	
20	26	56	64	56	64	0	0	***
21	26	48	48	64	64	16	16	
22	27	48	52	64	68	16	0	
22	28	48	52	64	68	16	0	
23	31	53	57	70	74	17	17	
25	38	49	51	108	110	59	59	
26	29	64	72	64	72	0	0	***
27	28	52	52	68	68	16	0	
28	30	52	56	68	72	16	16	
29	40	72	74	126.5				

You are up and running in no more time than it takes for you to copy *PM*'s four program files and get into BASIC.

Each program does a different kind of analysis, and each is described in a separate chapter. The manual outlines the concepts behind the analysis techniques and explains how to use the programs. Although the concepts are sometimes poorly explained, the instructions on how to use the programs are always clear.

THE CASE STUDY

The case study can be analyzed by running CPM.BAS (CPM means critical path method), the first of *PM*'s programs. The data input takes about 30 minutes. The program then requires about 110 seconds to determine the critical path and the amount of float for each activity. The resulting network analysis is displayed on the screen and can be printed out. *PM* doesn't produce highly sophisticated reports, so if you need a Gantt chart or a PERT chart, you have to draw it. On the other hand, the printout flags critical path activities. It also indicates the earliest possible start and finish days for each activity as well as total float and free float.

CPM.BAS doesn't offer you the option of cutting out activities and putting them back in, but you can change the data on any activity. For example, you can fool the program into dropping activity R in the case study by giving it crazy new values. For instance, you could say that R takes place between nodes with negative numbers and takes no time.

● *This network analysis chart from IIE's* Project Management *shows task start and end nodes, total and free float, and tasks on the critical path. An added feature is the calculation and display of the total project duration.*

When you ask CPM.BAS to recalculate the critical path, it lists this "dummy" activity, but since it has no effect on the rest of the project, the analysis is still correct. The new critical path now runs through activities P and Q, and the total project completion time is cut by 2 days. The R task can be put back by giving the dummy its original values, and you get the old network analysis back.

Thus, you can delete and reinsert activities, but the fact that you have to use trickery to do it highlights one of CPM.BAS's great weaknesses: before you enter the data for a project, you have to tell the program exactly how many activities will go into it, and you can't add or delete from this number while using the program. After the analysis is finished, you can only modify activities. Moreover, you can't save the data you laboriously key into CPM.BAS. Once you exit the program, it is gone; you can't store data on disk and play with it later. In the real world, where project activities come and go and where one day's analysis must be changed the next, these are serious limitations.

PM's other three BASIC programs perform different analyses, but since the programs do not communicate among themselves, you have to key in the project data all over again. PERT.BAS (PERT stands for Project Evaluation and Review Technique) converts your best guesses of how much time each activity will take into an estimate of how long the entire project will take. You enter three different time estimates for each activity: an optimistic, a most-likely, and a pessimistic estimate.

The program then calculates the mean and the variance of the three time guesses as well as the mean and variance of the earliest and latest possible project completion dates. The program assumes a normal distribution of completion dates and calculates the likelihood of meeting a particular time schedule.

RESOURCE.BAS is supposed to tell you the best sequence for your activities if you have a limited resource. However, the program assumes that all activities require the same resource and that when one activity is finished, all its resources automatically move to the next activity—a silly assumption. For example, if the limited resource is manpower, it assumes all your workmen can do any job in the entire project. In other words, once the bricklayers finish laying bricks, they should start putting down the floor. The program also assumes there is only one limited resource, whereas there may be any number.

Within these constraints, the program calculates the start and finish times for each activity so that the resource is efficiently used. Obviously, the program can't change the sequence of activities that are dependent on the completion of others, but it will speed up or hold back individual start times so the whole project can be completed as quickly as possible.

PM's fourth program is AON.BAS (AON stands for Activity on Node). It offers an analysis similar to those of the CPM.BAS program, except it assumes that activities take place on the nodes of a PERT chart rather than on the lines between them.

Overall, *PM* is an unsophisticated software package. It may be useful under limited circumstances, but you can't expect much from programs only 200 or 300 lines long. With all due respect to the work that went into it, this is the type of software you might find for $25 at a local user's group or even for free on an on-line bulletin board. **—Jared Taylor**

PROJECT SCHEDULER 5000: A GRAPHIC TOUCH

PC FACT FILE

Project Scheduler 5000, Version 2.0
Scitor Corporation
256 Gibraltar Dr., Bldg. D7
Sunnyvale, CA 94089
(408) 730-0400
List Price: $395 with graphics; $345 without graphics.
Requires: 266K RAM, two disk drives, IBM color graphics board.

CIRCLE 781 ON READER SERVICE CARD

Project Scheduler 5000, by Scitor Corporation, provides an unusual combination of features among current market offerings: critical path analysis with powerful project cost and resource charting.

The program allows you to produce both histograms and line charts of important project data, such as labor and other resource costs. You can graph projected costs against current real costs at any point in the project. Moreover, its graphing feature is well integrated into the package, so the graphs are as easy as 1-2-3 to produce.

SIMPLE INSTALLATION

Although *Project Scheduler 5000* is copy protected, installation is simple. You must use the program disk at all times, but you do get a backup; no special initialization routine is necessary. I just removed the disk from the package and began running the program.

A tutorial exercise runs for several chapters in the reference manual and requires a little more than 2 hours to complete. It covers most of the important features of the package and is easy to follow because the keystrokes are clearly highlighted and the accompanying explanatory text is helpful.

The documentation is thorough, and many examples of screens are included in the manual. The manual is well organized and has an index. I found it was easy to find the answers to all my questions.

THE CASE STUDY

The case study required more preparation than with other programs and took about 2½ hours to enter because of the design of the case study, not necessarily because of the program itself. For example, each task in the case study is alphabetically labeled, and *Project Scheduler 5000* accepts only numeric entries in its task code field.

Another reason input of the case study took longer than with some other packages was that *Project Scheduler 5000* allows for extremely detailed entry of resource information on each task. You can define up to 96 different resources for each project, including cost per time unit, whether the resource is labor or nonlabor, and the number of units of the resource required for the duration of the task. This feature allows careful, realistic planning of resource allocation and budgeting.

One important feature that *Project Scheduler 5000* is missing is the ability to produce a network analysis diagram, or PERT chart, which was developed, after all, to facilitate an easy look at the "big" picture. However, aside from this shortcoming, *Project Scheduler 5000* produces a variety of helpful reports, such as a Gantt chart and a schedule of resources and costs.

You enter projects by filling in a number of fields for each task and then sending the information to a Gantt chart. Then the program redraws the screen after each task entry. This process slows down entry, but in real life, you would naturally pause to look up notations on the next task; there-

fore, the 5-second delay should not be frustrating in most situations. The program handles deletion, insertion, and addition of tasks well, making adjustments to the rest of the project as necessary.

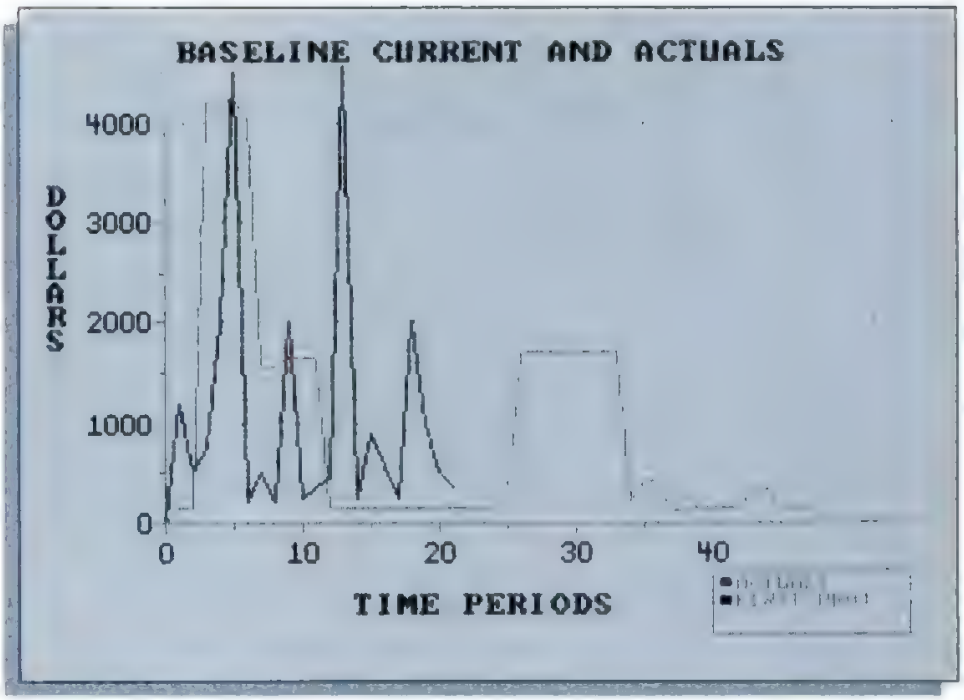
FEATURES

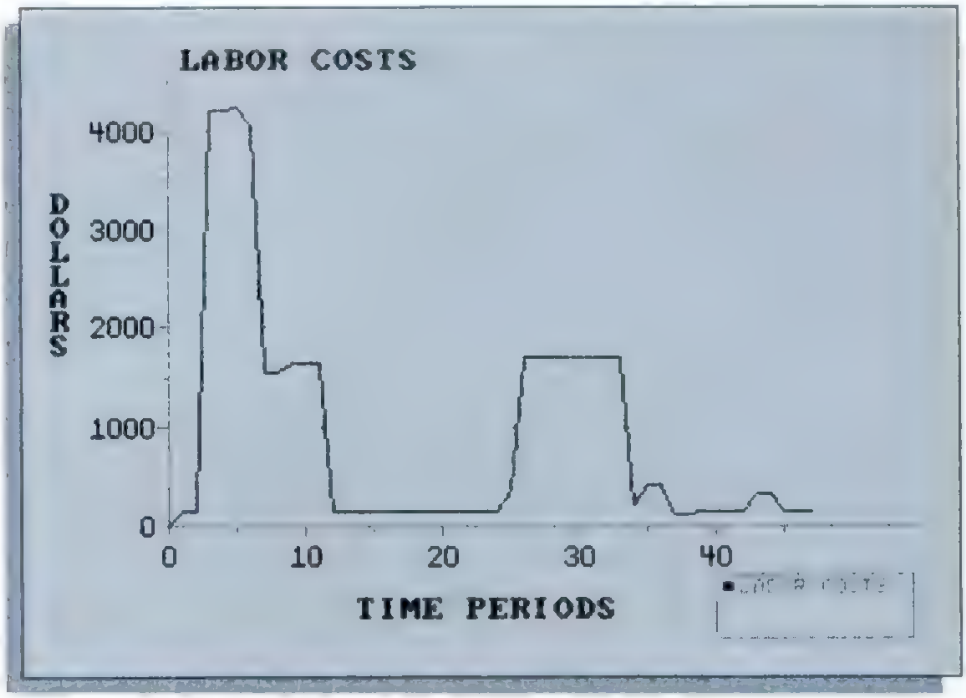
The report generation facility of *Project Scheduler 5000* is impressive because it's comprehensive and easy to use. Report selection is consistent with the rest of the program in providing menus for all the needed interactions. The reports include printouts of the work week definition and calendar for the project, a listing of all resources involved with the project and their related costs, a Gantt chart, a schedule of resources and costs on a time unit basis, and a listing of the total cost for each resource.

In addition, *Project Scheduler 5000* offers a Selectable Job Report option, which allows a wide variety of different analyses of project data. Project data can also be output in a DIF format for interfacing with a spreadsheet program.

The graphing facility of *Project Scheduler 5000* offers some interesting options for presentation of project data particulars. The main graphics menu lets you choose submenus to input actual costs for a project, specify the colors you want to use in your graph, and choose the graph type.

You can graph resource allocation units—that is, the number of resources of each individual type—by time period, either for the entire project or for a specified time period. You can also graph





● Project Scheduler 5000 *can plot actual labor costs either alone or in comparison with target costs.*

Our prices on IBM, IBM-compatible and Apple II, Apple IIe, and Apple II+ HARD DISK SYSTEMS.

We've sold thousands of these super-reliable hard disks in the last 12 months.

However, if you haven't bought your **Mercury MegaBank** hard disk yet, you're in luck.

Now, the price is right.

The MegaBank Archive: a complete **10-megabyte** hard disk for use in the second floppy bay of your PC — ONLY: **$795**

The MegaBank 10: a complete **10-megabyte** single bay hard disk system — ONLY: **$995**

The MegaBank 20: a complete **20-megabyte** single bay hard disk system — ONLY: **$1,495**

The MegaBank 40: a complete **40-megabyte** single bay hard disk system — ONLY: **$1,995**

The MegaBank Streamer: a solid-cartridge **tape unit** that plugs into your PC to back up your MegaBank 10, 20 or 40. Copies up to 20 megabytes, in approximately seven minutes, & no extra slot is required. — ONLY: **$995**

You'll be up and running in minutes. With MegaBank, you simply add the included adapter board to your PC chassis, plug in the hard disk unit, and turn it on. Everything you need is included, so don't worry about tricky installation or "extras".

And every MegaBank product is fully supported by our "no-risk" customer service network. We're standing by with a User's 800 Line to provide answers to technical questions or to give you helpful hints.

Every MegaBank component is warranted for a full 90 days.

Finally, if you aren't satisfied — for any reason — just return your order to us within 30 days. On the day we receive it, a full refund check will be on its way to you. When we say "no-risk," we mean it.

TO ORDER OR FOR MORE INFORMATION, CALL 800-551-7666.

In Illinois, 312-951-0616.

We accept Visa, Mastercard and American Express, and we'll ship within 48 hours of receiving your credit card order or check.

There is an additional charge of $33 per item ordered for shipping, handling, and insurance

Specifications:

All Megabank drives are 9⅝" wide by 5⅝" high by 14½" deep.

Runs on your IBM compatible with DOS 2.0, 2.1, or CP/M 86. Apple compatibles: DOS 3.3, ProDOS, 1.01, CPM and Pascal.

Average access time 93M Sec. with a 5.0 Bits/Sec. transfer rate.

IBM® and Apple® compatible

Mercury MegaBank Corporation
311 West Superior Street Dept. 416
Chicago, IL 60610

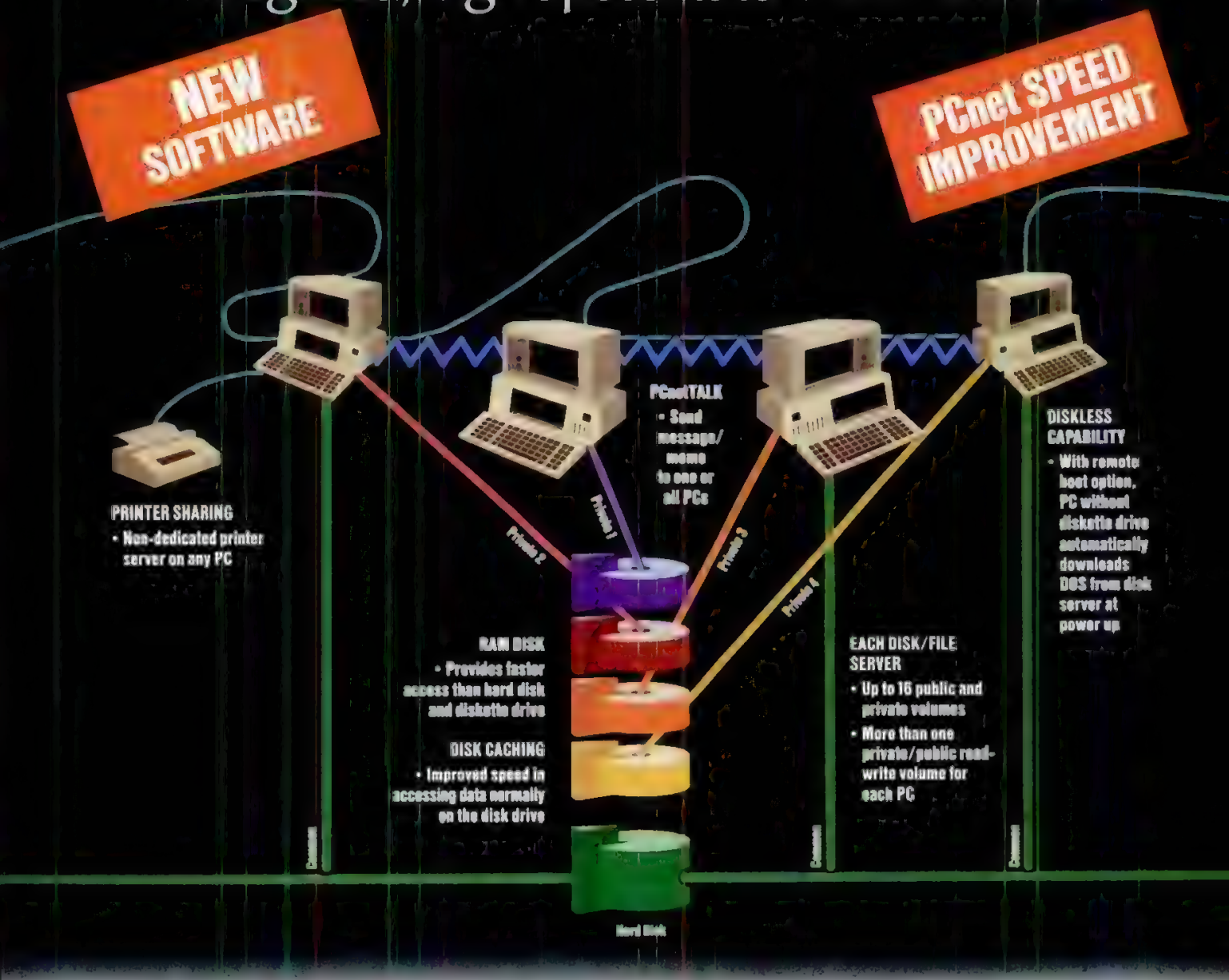
IBM and Apple are registered trademarks of International Business Machines, Inc. and Apple Computers, Inc.

10 meg shown

CIRCLE 160 ON READER SERVICE CARD

PCnet™ from Orchid Technology

The Most Advanced, Affordable Way to Transform Your Personal Computers into a Fully Integrated, High-Speed Local Area Network.



PCnet is the lowest cost network for IBM™ PCs. Take your choice.

$495 per node when purchased as a stand-alone.
$395 per node when purchased with BLOSSOM (384K RAM, Clock, IO)

Orchid, the creator of PCnet, has made high-performance local area networking affordable to all PC users. Contact your local dealer or Orchid today to unlock the power of your IBM PC and find out more about our full line of products.

PCnet—Stand-alone Network Board
PCnetPlusRam™—PCnet + 256K RAM
PCnetBlossom™—PCnet + 384K RAM + Serial Port + Parallel Port + Clock Calendar
Blossom™—New Generation Multifunction Board
PCturbo™—The Ultimate IBM PC productivity enhancement board

ORCHID
ORCHID TECHNOLOGY
47790 Westinghouse Drive
Fremont, CA 94539
(415) 490-8586 Telex: 709289

IBM PC is a registered trademark of International Business Machine Corporation
PCnet, PCnetPlusRam, PCnetBlossom, Blossom and PCturbo are all trademarks of Orchid Technology

CIRCLE 412 ON READER SERVICE CARD

resource costs, with labor costs either included or in a separate graph.

Once you input actual costs, several interesting graphing options become available, including planned project costs versus actual costs. The remainder of the project costs are projected based on actuals. You can also graph a comparison of period-by-period costs for the baseline plan, a revised plan, and actual costs to date.

Graphs are displayed on screen and can be sent to a printer or plotter with a few keystrokes. This graphing facility provides a powerful planning tool to help monitor the progress of a project. It is much easier to analyze detailed comparisons of financial data using graphics than it is to strain your eyes on reams of spreadsheet-type printouts.

PROJECT SCHEDULER 5000 IS AN EASY-TO-USE PROJECT PLANNING PACKAGE WITH TRULY OUTSTANDING GRAPHICS CAPABILITIES. IT EFFECTIVELY USES THE CRITICAL PATH METHOD.

AN EASY-TO-USE PACKAGE

Project Scheduler 5000 is an easy-to-use project planning package with truly outstanding graphic capabilities. The package does not do network analysis but effectively uses the critical path method. *Project Scheduler 5000* is a good package for you to consider purchasing if its features meet your project planning needs.

—Diane Burns

TARGET TASK: ANSWERING THE 'WHAT IF'

PC FACT FILE

TARGET TASK, Version 2.21
Comshare, Inc.
5901 B Peachtree Dunwoodie Rd.
#275
Atlanta, GA 30328
(404) 391-9012
List Price: $329
Requires: 128K RAM, one disk drive.

CIRCLE 791 ON READER SERVICE CARD

Answering "what if" questions is one of the microcomputer's most valuable assets. Planning a complex project on paper, preparing a Gantt chart, and writing management estimates are useful planning exercises, but using a computer to answer "what if" questions prepares you for the real world of late deliveries and broken promises. *TARGET TASK*, distributed by Comshare, Inc., can help you answer "what if" questions about the monetary and schedule impacts of changed deadlines and late or early deliveries.

The *TARGET TASK* manual is written clearly and includes both a practical guide to program planning and PERT chart construction and clear descriptions of the various portions of the program. Screen displays and reports are provided along with the text describing your options. Sample models, internal glossaries, and an excellent index are also included, but you may not need to reference them since the program itself has good prompts and well-designed screens.

THE PC MAGAZINE PROJECT

TARGET TASK is menu-driven. Menu presentations are well organized and include help screens for every option.

The data entry screen gives you a clear picture of information you must supply for

a given project task. Each entry is checked for validity. If you repeat an entry, an error message tells you that an identical path exists. The only negative feature of the input screen is that you can't back up and see the tasks you entered previously. Reviewing your work is useful, for example, if you are interrupted and lose your place in the task list. The screen will tell you how many inputs you made, but nothing beats seeing your previous work.

When you enter tasks into *TARGET TASK*, the program asks for optimistic, normal, pessimistic, and crash completion times. It also asks for an estimate of the average cost to complete a task and the cost of a crash effort. These various estimates will allow you later to contract or expand the schedule and see the results in time and dollars. As I went along, I made up estimates of the effectiveness and cost of expediting tasks in the PC model. If you build a model using *TARGET TASK*, it is well worth the effort you will expend to develop good estimates of the various timing and cost factors.

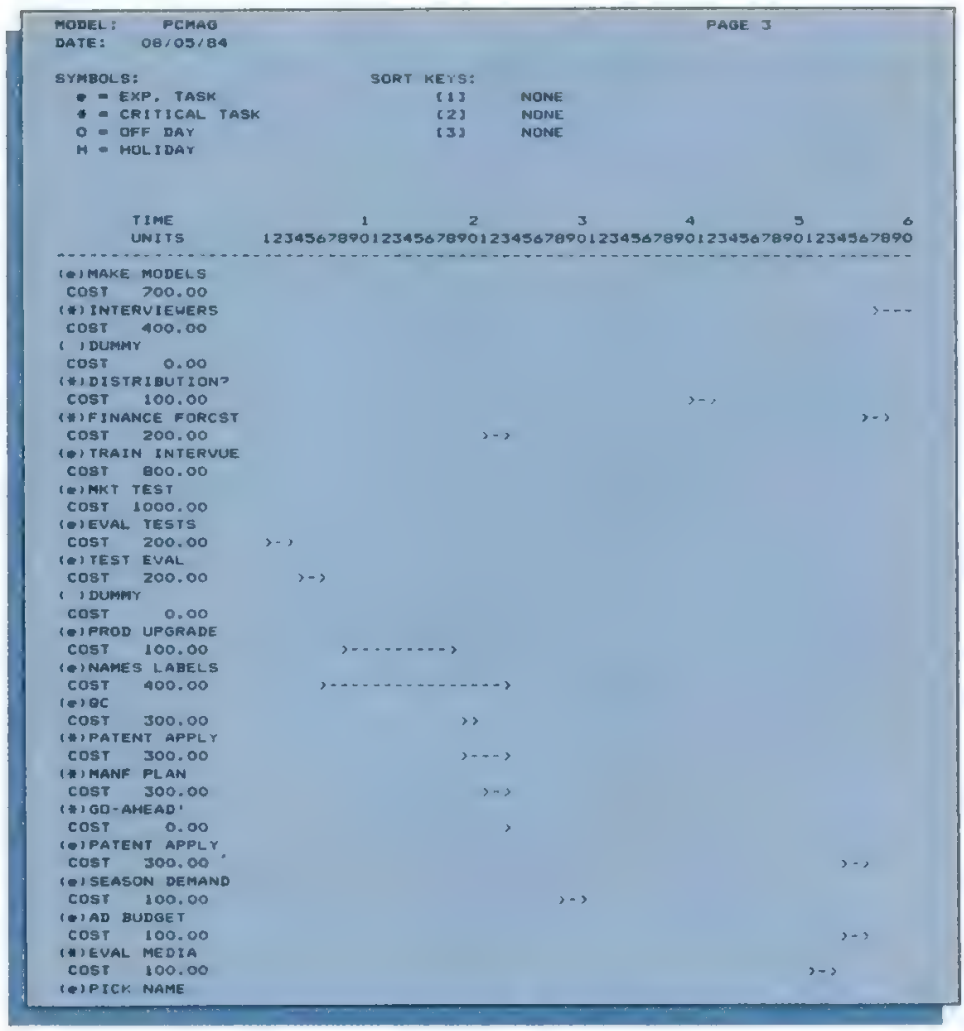
The *TARGET TASK* software can't project manpower requirements, print PERT charts, or directly show the funding schedule, but it does give you a good picture of what will happen to your project if you compress or extend the completion dates. *TARGET TASK* produces the task list, Gantt charts, and a comprehensive management report. The changes specified in the PC project were easy to make. You use the original numbered task nodes in your model to specify the tasks you want to change or delete. The Gantt chart was recalculated in a matter of seconds.

● TARGET TASK *distinguishes critical tasks with an asterisk in the left-most column.*

The program accepted the holiday schedule and, indeed, it comes with the major holidays already built in. The only anomaly I found was that the calendar in *TARGET TASK* would not accept the 1968 starting date specified for the PC model. The authors apparently did not expect you to chart anything that happened before they wrote the program.

TARGET TASK takes quite a while to prepare its management report. The program computed and printed for about 40 minutes while it described the details of each task. It also came up with the maximum number of days the task could be delayed without affecting the completion date of succeeding tasks.

Each time you run the *TARGET TASK* software, it displays a series of cost/time values. This list shows you how much it would cost to complete the project within a certain time based on the expediting



charges you entered into each task. The list shows various combinations of the most pessimistic and optimistic predictions. When you generate the Gantt chart and management report, you can select one or more specific times from the list and generate charts based upon these advanced or compressed schedules. You can perform "what if" exercises with the project by changing the optimistic and pessimistic dates and costs for specific tasks, generating the model, and then printing charts for various maximum time periods. Each one of the charts generated for a selected period will display reduced float times and changed costs.

HARDWARE REQUIREMENTS

TARGET TASK will run in a system with as little as 128K RAM and one disk drive. The number of tasks you can enter is limited only by the RAM size of your computer. The program displays the number of tasks it can accept on the top of the input screen. When the program ran in my 512K PC, it could take 531 tasks.

The PC-DOS version of *TARGET TASK* does not use the PC special function keys, color, or graphics. It can print its charts on any 80- or 132-column printer including daisywheel or thimble machines. The program is not copy-protected and it runs well on a computer equipped with a hard disk. Files can be saved and loaded from any drive in the system, project directories can be displayed, and existing files can be erased.

TARGET TASK is well-designed and well-written software. The screens effectively guide you through the operation, and the program forgives errors. At $329 it is fairly priced and will allow you to perform real "what if" studies of your project.—**Frank J. Derfler, Jr.**

TASKPLAN: WHAT DO YOU WANT FOR FREE?

TaskPlan
Williams Software & Services
1114 Pusateri Way
San Jose, CA 95121
(408) 227-4238
List Price: Free (send disk and self-addressed, prepaid mailer); $20 contribution suggested.
Requires: 96K RAM.

CIRCLE 745 ON READER SERVICE CARD

TaskPlan is little threat to mainstream project management programs. The spare-time creation of San Jose engineer C. Lamar Williams, *TaskPlan* records a project of up to 50 tasks spread over 60 time periods, calculates costs for each time period, keeps a running tally of all project costs, and provides a histogram of the results.

Unfortunately, *TaskPlan* focuses on tracking expenses and neglects the broader area of managing personnel, materials, and deadlines. Most users will find that this lack of features precludes using the program for serious project planning.

TaskPlan is available for the asking. Send a disk and a prepaid mailer to Williams Software & Services, try it out, and, if you like it, send along $20.

INSTALLATION

There are no instructions for installation; it's a straightforward process. Copy the two files from the original disk (TASKPLAN.BAS and SAMPLE.TPN) onto a working disk, copy BASICA from your own DOS disk onto the working disk (or issue a PATH command pointing to the directory containing BASICA if you have DOS 2.0/2.1), and you're in business. Elapsed time: about 3 minutes. To start *TaskPlan*, type BASICA, hit Enter, and load TASKPLAN.BAS.

TaskPlan requires one disk drive and 96K RAM. Color or monochrome monitors work equally well; there are no graphics except for the PC's monochrome graphics characters on some of the introductory screens. All printed output uses the first 128 ASCII characters, so no special graphics printer is required.

No tutorial is provided with *TaskPlan*, but loading the eight-task sample file and manipulating the sample data for an hour or two will give you a feeling for how *TaskPlan* works.

TaskPlan's documentation consists of a 14-line label on the disk envelope and two screens of information that appear each time you boot the program. The screens should be printed out with the Shift-PrtSc combination. Even by free-but-send-a-few-bucks-if-you-like-it software standards, that's a bit Spartan.

THE CASE STUDY

After loading *TaskPlan*, the user is prompted for a general project name, the number of tasks (2–50) and time periods (2–60), a choice of normal rounding or "conservative" rounding (where any number with a fraction is rounded upward), and two cost multipliers. The M1 multiplier can be fixed or allowed to vary task-by-task (to allow for extra overhead on some tasks). Using the M2 multiplier rounds the costs you input into different output costs; for instance, using .001 as the M2 multiplier converts dollars into thousands of dollars for rough eyeballing of expenses. Using conservative rounding and a .001 multiplier, a $5,420 cost would be rounded up to $6(000).

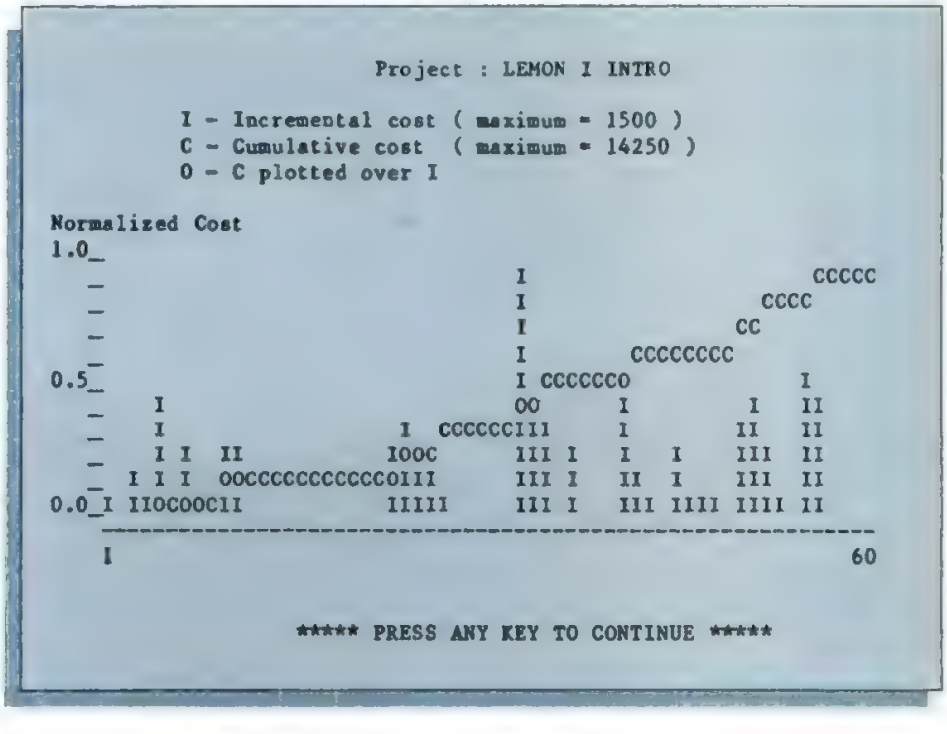
Tasks can be entered on a data-entry screen in groups of ten. Each task gets a name of up to 20 characters, a start time ranging from 0 to 59.99 (*TaskPlan* allows scheduling in terms of up to 60 user-specified time units), an end time ranging from greater than the start time to 60, a cost (up to $9,999,999.99, or higher using exponentiation), and a cost multiplier if a task-by-task multiplier was chosen. *TaskPlan* lacks full-screen editing; mistakes within a field can be corrected by backspacing if the Enter key hasn't been hit yet. Otherwise, you have to wait until after you've entered a group of ten tasks, at which point *TaskPlan* offers a chance to correct typing or data-entry errors. The process is sluggish and a bit awkward.

Once all tasks have been entered, *TaskPlan* allows the data to be saved to disk and calculates and displays costs for each of the 60 time periods and cumulative costs. Optionally, a histogram of the results is available that shows incremental costs (I), cumulative costs (C), and C/I.

Finally, *TaskPlan* offers to print the raw data, a cost summary, and a histogram.

I chose to use weeks for the time periods, where each work day amounted to .2 units (one-fifth of a week). For instance, a 6-day project beginning on a Tuesday might stretch from time period 5.20 to 6.40. Even so, the case-study data had to be spread over two files because it exceeded *TaskPlan*'s 50-task limit and required over 60 week-long periods.

From start to finish, the project took about 3 hours. That included a necessary side trip into Lotus's *1-2-3* to generate a calendar that showed the dates corresponding to the 60 weeks beginning at



● Task/Plan *plots incremental and cumulative costs for a project with a duration of 60 time periods.*

IF "C" IS YOUR LANGUAGE,

LATTICE WINDOW™

From Now On, All Your Applications Could Have Windows!

NEW RELEASE!

Windows are no gimmick. Ask any user of a windowed product.

Windows can bring unrehearsed combinations of data side-by-side for viewing. Windows can overlay new information atop old, yet can restore the old with a keystroke. Windows let the limited space of a screen show many things, not just one thing.

Windows are one of the new software features people have come to expect. And why not? They make using software more convenient, more versatile. But how do you add this technique to your applications without disappearing for several months of R&D?

With Lattice Window, that's how. It's a product we've been waiting months for. One of those rare programming tools which will change the way you think of program design. Here's how:

Lattice Window takes over all screen management. It is an extensive set of object code functions which you merely call from your C program.

Think of a window as a screen, a screen of flexible size. You can tell Lattice Window to open and close many such virtual screens. Up to 255 at a time, each from 1x1 to 255x255 bytes. Then tell "Window" to display any portion of these virtual screens on the physical screen — as many as fit. Tell "Window" to place them wherever you want, overlapping and overlaying at will.

Windows no longer needed may be closed. Any background area overlaid earlier (which could be corners of several windows) will pop back to the screen. Think for a moment what a programming job that technique represents.

To your program, the entered window is the *entire* screen — all row and column references are relative to the window no matter its absolute position in the screen. All scrolling occurs only within the active window. The cursor will not leave its boundaries until your program says to. Any screen window may be entered for display, data entry, whatever. *Any* virtual screen — displayed or not — may be read from or written to by your program.

- You can move a window on the screen.
- You can grow it to display more of the underlying virtual screen. Or shrink it to show less.
- You can control screen attributes (color, blinking, inverse video, etc.) of any window.
- You can direct output to either the monochrome or color board.

It's a formidable product which will add incomparable flair to your next application!

Product Code: S0800
Suggested Price: **$295.00**

Our Price:
$235.00

HALO

A Spectacular Graphics Extension to Lattice C

Halo™ will astound you. It provides a complete library of graphic functions which can be linked with your Lattice programs to create full-color charts, graphs, simulations, even animation.

Over 100 commands are at your disposal, including plot, line, arc, box, circle, plus single commands to produce bar graphs and pie charts. Pattern-fill and dithering commands give your graphics impressive texture and color mixes, rubber-banding draws shapes for interactive users, area moves produce animation, fill and flood commands paint areas. The newest version allows you to define your own world coordinate scheme, divide the screen into "viewports" (windows), and scale graphic figures automatically.

It's a long list of capabilities which make for an extraordinarily powerful product. In fact, Halo is so good that manufacturers of graphics boards and systems are adopting it as a standard graphics language. So it can bridge your application to other systems. CAD-CAM developers, especially, have embraced its device-independent approach for maximal portability.

Halo is a dazzling demonstration of why C has become the language of choice among programming professionals: its function library architecture means you can tremendously enhance your firepower by acquiring libraries of software like Halo with dramatic economy of time and money.

Requires IBM monochrome or color graphics card or equivalents.

Product Code: S0300
Suggested Price: **$200.00**

Our Price:
$125.00

PMATE

The Programmer's Word Processor

Pmate was designed for programmers. We'll wager that you cannot find a programmer who has discovered Pmate and moved on to something else.

Pmate is a full screen editor with ten auxiliary buffers for squirreling away pieces of text until needed. It uses single key commands to move the cursor, or text, or insert or delete, or rescue several thousand characters of deleted text.

It has a format mode for tab setting or wraparound and shaping when it's time to write documentation. Pmate lets you assign chains of commands or strings of text to single keys: one keystroke could set up the entire shell of a new C function, for example.

Pmate has variables, if-then statements, loops. It calculates, and converts decimal to hex to binary and back. You can write compact programs (called "macros") to delete comments, for example, or check syntax, or process long sequences of commands. Macros can alphabetize lists, do row and column math, perform a series of operations on multiple files, even summon other macros.

Put another way, Pmate is a text editor with its own built-in interpretive language. A language you can use to completely customize this text editor to your fancy. Possibly the most artful, ingenious program you have ever seen.

Product Code: S0600
Suggested Retail: **$225.00**

Our Price:
$175.00

PLINK86

Overlay Linkage to Expand

Software is becoming ever more sophisticated, which means more complex programs requiring large chunks of memory. But if you use extra memory, if you count on users to have expanded RAM, you will forego sales to those who do not.

Plink86 is the answer. It takes on the job of shoe-horning large programs into small memory. First, Plink86 acts as an alternative to DOS' Link. For a language like C which encourages design of separately compiled object modules in the Microsoft relocatable format, Plink86 pulls modules together into single compiled programs. But Plink86's overlay power is what has gained it a reputation as a miracle worker. It binds into the compiled program its overlay manager which knows how to swap modules of your large linked program between disk and memory, so that each can temporarily occupy the same memory space.

Unlike other linkers, the overlay manager acts on its own, needing no calls from the source program. Instead, Plink86's straightforward overlay description language allows you to describe your overlay structure in one place in your program — a structure

PC BRAND HAS THE TOOLS

Your Productivity Could Take Off With Our Craftsman™ Line of Precision Tools

C-FOOD SMORGASBORD

A Menu of Difficult to Prepare C Functions

C is a language of function libraries: sturdy routines which your application can effortlessly reference to get the job done. But someone has to write them. It would take months to concoct and perfect the complex and useful servings which have been prepared for you and thoroughly tested in C Food Smorgasbord™.

Decimal Arithmetic: Functions to perform operations on binary-coded decimal (BCD) numbers of up to sixteen significant digits. Includes trigonometric and logarithmic functions, powers, conversions to strings, and much more.

Level 0 I/O Functions: Enable you to perform direct I/O operations for screen, keyboard, printer, and asynchronous port with no dependence on higher I/O functions to minimize memory usage and maximize speed.

IBM™ PC BIOS Interface Access: Allows you to get at the basic I/O services in the ROM BIOS not available through the normal operating system to get and set the video mode, cursor position, color and screen attributes, keyboard shift, scrolling, printer channel and port status.

TIP, the terminal independence package: Lets you easily move programs to computers with different types of terminals.

There is a basket of delicacies beyond this brief list; a cornucopia to sample, any one of which will save valuable time and pay back far more than C-Food Smorgasbord's overall price.

Product Code: S0200
Suggested Price: $150.00
Our Price: **$115.00**

All products operate on the IBM PC or PC/XT under PC-DOS and require no more than 64K of RAM unless indicated.

Prices, terms and specifications subject to change without notice.

Prices do not include shipping and handling.

You may freely use these products to create software applications for re-sale without additional licenses or royalty payments, provided your applications are not wholly or substantially replications of the products themselves.

Unix TM Bell Laboratories / Lattice C, C-Food Smorgasbord, and Lattice Window TM Lattice Inc. / MS TM Microsoft Inc. / Halo TM Media Cybernetics / IBM TM International Business Machines / Float87 TM Microfloat / Panel TM Roundhill Computer Systems Ltd. / Plink86 and Pmate TM Phoenix Software / CP/M-86 TM Digital Research

PANEL

Are You Still Coding Hand-Made Data Entry Screens?

Designing custom screens is intricate, time-consuming, and costly. It can make you the loser in competitive bidding. It can add weeks, even months to bringing your product to market.

But not when you use Panel™. Put Panel to work and you hire a superprogrammer for the minimum wage. Telling Panel your screen design is like using a word processor. You can add, move, copy, delete, and reshape fields with single key commands. The result? Finished C program code with field descriptors, color and highlighting, input editing by type of field, help keys, and warning messages.

Panel can also create a terminal selection program customized for your application, and gives you a utility to quickly test your finished screens. It even includes a multi-key data file maintenance program which interacts with the screen you design. All the tools you need to generate code for the trickier aspects of your application, or even to create stand alone data entry and retrieval products without *any* programming.

Panel routines are powerful. Unlike so many programs which make error correction difficult once a field is departed, Panel gives the user full field-to-field movement for editing, and overtype or insert/delete within fields.

A truly superior productivity tool every developer should have.

Product Code: S0400
Suggested Price: $295.00
Our Price: **$235.00**

FLOAT-87

Software Support for the 8087 Math Chip

Float-87™ is a library of floating-point math routines which are merged into a Lattice C interface library. The routines handle all arithmetic functions and the most frequently used transcendental or trigonometric functions, and pass all numbers to the 8087 to take advantage of its 80-bit data format.

Putting Float-87 to work with an 8087 can increase the speed of floating-point calculations by 40 times or more — and with greatly expanded accuracy. If you or your customers have an Intel 8087 math processor chip on board, this software will switch on its afterburners.

Product Code: S0700
Suggested Retail: $125.00
Our Price: **$100.00**

Your Art of the Possible

permitting up to 4,095 overlays stacked 32 deep. And you don't have to re-compile to re-arrange the structure.

Plink86 is a two pass linkage editor. On the first reading it determines all modules which need loading, to insure greater flexibility in assigning memory segment addresses before the disk file is created on the second pass. It can even sub-divide its linked output into multiple files for programs which must span more than one disk.

But most of all it sets you free to write the comprehensive code today's users have come to expect without sacrifices to memory constraints.

Product Code: S0500
Suggested Price: $395.00
Our Price: **$315.00**

You won't find an offer like this elsewhere: Exceptional prices and software fully supported by a knowledgeable staff specializing in 'C' and companion tools.

1-800-PC BRAND

That's 1-(800) 722-7263. In NY State call (212) 410-4001.
Charge your purchase to MasterCard or Visa.
Or mail your order and check to
PC Brand, P.O. Box 474, New York, N.Y. 10028

© 1984 PC Brand

PC Brand and Craftsman are trademarks of PC Brand

CIRCLE 310 ON READER SERVICE CARD

week 0 for February 15, 1968, the starting date for the case study. The project should have taken less time, but a glitch on the very last entry of one file sent *TaskPlan* into a tailspin, so I had to enter the data again. Here's what happened: I inadvertently entered 60.00 as the start time for the last task. A checking routine requires the end of each task be at least .01 time units later than the beginning time. But (Catch 22!) another routine allows no time greater than 60.00. Unable to conjure up a number at least .01 greater than 60 and yet not more than 60, and unable to back up a step in the data entry, I had only one solution: to reboot the system.

A task can be deleted by inserting a dummy task with a cost of 0 and minimal time (.01 units) in its place. Moving the task is accomplished by changing start and end times; since *TaskPlan* doesn't sort by date, there's no need or easy way to move the physical location of a task within the data file. To add tasks, you must rerun *TaskPlan,* choose the "Use previous project" option, and add the tasks.

Of all the reports one might expect from a well-rounded project manager, *TaskPlan* generates only the task list (unsorted), an incremental and cumulative costs list (a funding schedule), and a histogram. Gantt and PERT charts, holiday schedules, resources lists, and manpower loading charts are beyond its realm.

SPECIAL FEATURES

As might be expected of a free program written in BASIC, there are few bells and whistles.

One unadvertised feature is that *TaskPlan* data can be generated using the nondocument mode of a word processor or even a database that can convert its output to comma-delimited files. If you did find a continuing use for *TaskPlan,* this would considerably speed up the data-entry procedure.

Each task would be entered like this (alphabetic entries must be surrounded with quotation marks):

"Task name," start time, end time, cost<Enter>.
Variable cost multiplier (if used) <Enter>.

Precede the task data with this header:

"Project name," number of tasks, number of time periods, "N" or "C" (for normal or conservative rounding), "C" or "V" (for a constant or variable M1 cost multiplier), actual M2 cost multiplier<Enter>.

OPINION

TaskPlan begs the question: "Why does this program exist?" If you're serious about managing a project, the time needed to use the program quickly outweighs the attractiveness of its low price. What you get out of *TaskPlan* might be less than the effort you have to put in.

TaskPlan addresses only a limited area of project management: recording and tallying costs when you already have a good idea of what the costs will be. Any self-respecting spreadsheet or database could do the same work, but without pausing to catch its breath or suffering the artificial restraints of 50 tasks and 60 time periods.—**William K. Howard**

VISISCHEDULE: QUICK, CLASSY, AND COLORFUL

FACT FILE

VisiSchedule, Version 1.2
VisiCorp
1953 Lindy Ave.
San Jose, CA 95131
(408) 946-9000
List Price: $195
Requires: 128K RAM, two disk drives.

CIRCLE 782 ON READER SERVICE CARD

VisiSchedule is a fast, interactive, visually oriented project planning and scheduling program that is loaded with features. It is fully menu-driven and produces four comprehensive reports, either on the screen or on the printer.

Installing *VisiSchedule* is simple. The system disk is copy-protected, so all you need to do is copy over the system files from DOS if you would like to make the disk auto-booting. A booklet entitled *Getting Started* explains how to use *VisiSchedule* both with floppy disks and with a hard disk.

The package also includes a simple and effective tutorial, entitled *Quick Course*. It guides you through the steps needed to put a small project on the system and to print out reports. In 40 minutes, *Quick Course* explores all the major features of the program.

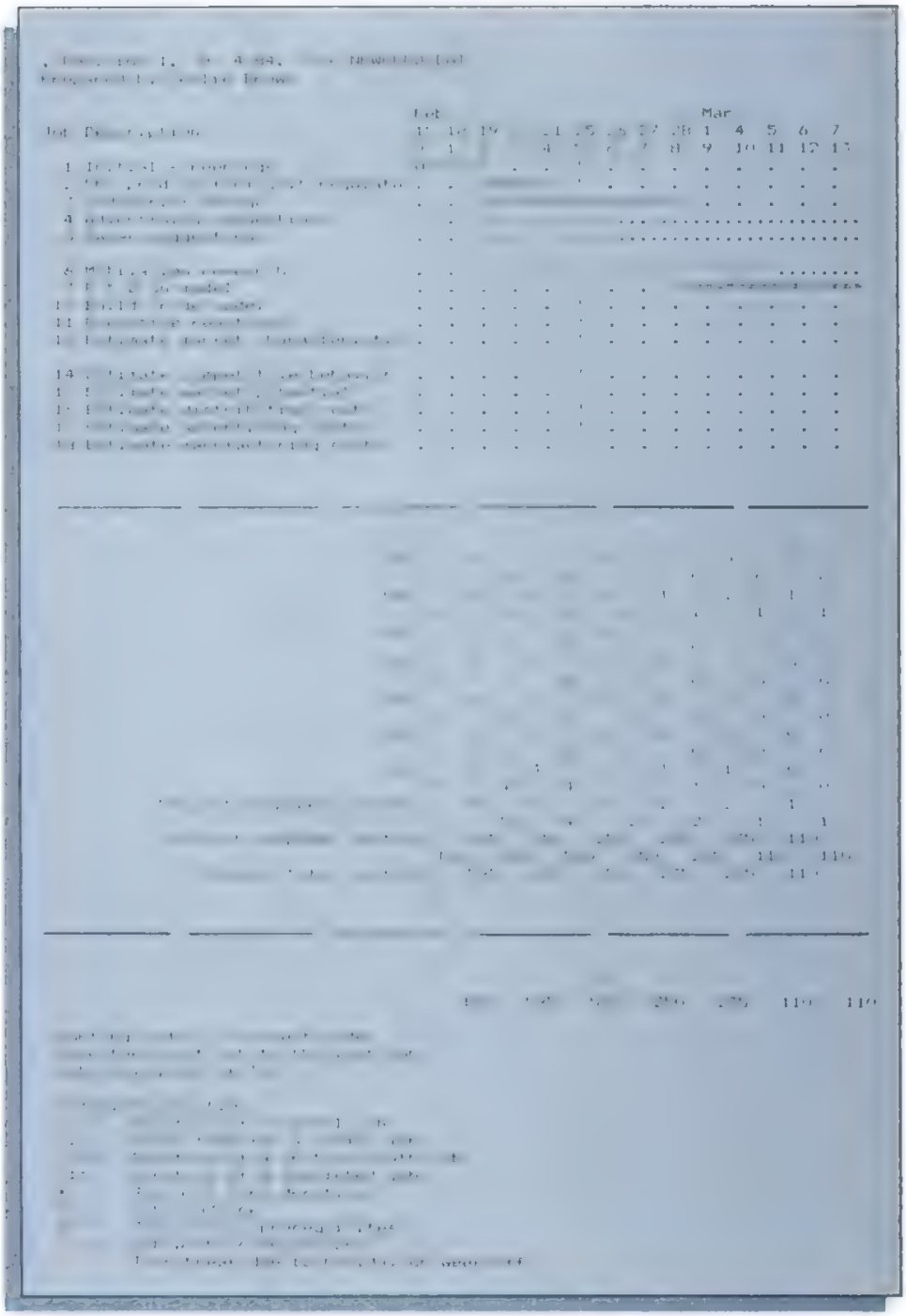
The rest of the documentation is just as good. The *Reference Guide* thoroughly describes all the program features, while the *Pocket Reference* serves as a handy reminder of the options and commands once you are familiar with the program. All of the documentation reads well and tells you what you want to know. The many illustrations show you what to expect on the screen when you select a command.

The case study took me about 3½ hours. Of that time, I spent only a little over an hour entering information. All of the rest of my time was spent printing reports.

REPORTS

VisiSchedule produces only four reports, but they are nicely designed and show a lot of information in a handy and usable way. For each job, the Job Description report shows the job number and description, job length, earliest and latest start and finish dates, slack time, prerequisite jobs, manpower required by skill category, the computer manpower cost, the direct cost, and whether or not the job is on the critical path. Printing this report for the 60 or so tasks in the case study took 20 minutes on my Epson MX-80 printer.

The other large report is the Schedule



● VisiSchedule *combines manpower loading and cash flow data on its Gantt chart.*

Graph, which is primarily a Gantt chart showing the calculated schedule for the project. Following the Gantt chart and using the same time scale, the report shows the manpower level required for each skill, the labor cost, the direct cost, and the total cost per time unit. *VisiSchedule* prints several sheets of paper as a single report "page" listing all the jobs in the project. It prints as many of these "pages" as needed to show the full time for completing the project. I found that printing this report for the case study took 17 minutes.

VisiSchedule produces two other reports, both much smaller. The first is a one-page Project Description report. It shows a summary of the job schedule, the manpower skill categories, and the holiday schedule. The second is called the Tabular Job report. It prints a single line per job—you select the information you want and the sequence. The only limitation is that the fields you select must fit across an 80-character report line. Together, these reports take about 4 minutes to print.

VisiSchedule did a good job of producing the information called for in the case study, but its reports did not coincide with the reports *PC* requested. *VisiSchedule* does not have a separate resource list, funding schedule, manpower loading chart, or holiday schedule. All of these items are incorporated into the Project Description report and the Schedule graph.

EASE OF USE

Adding, deleting, and inserting tasks took no discernible processing time. The only delay in these operations was caused when the screen was refreshed to show the updated task list.

VisiSchedule's nested menus make working with the program very easy. It presents information pertinent to the current function in the top 20 lines of the screen. The available program options occupy the next three lines. The next-to-last line is used to display messages, and the last line for data entry. To select an option, you move the cursor over the option and press Enter or just type in the first character of the word shown in the list of options. *VisiSchedule* draws the Gantt chart of the schedule on the screen as you enter information for the various jobs that make up the project. These screen features minimize the amount of typing and maximize the amount of relevant information in view.

VISISCHEDULE HAS MANY NICE FEATURES. THE ONLY MISSING FEATURE I CAN THINK OF IS ONE THAT WOULD ALLOW YOU TO SET A MAXIMUM NUMBER OF PEOPLE AVAILABLE WITH A GIVEN SKILL, A COMMON REAL-WORLD CONSTRAINT THAT THE PROGRAM CANNOT HANDLE.

I did have to do some preparation before starting the case study. *VisiSchedule* numbers the jobs—you give each job a description, but you do not control the number assigned. In the case study, the tasks are named by the originating and terminating nodes. Since I couldn't make use of this naming system, I had to renumber the tasks in order to build my own listing of dependencies and anticipate *VisiSchedule*'s number approach; it does not force you to draw a network diagram.

VisiSchedule lacks the capacity to handle the case study in two areas. First, it cannot handle fractional periods of time. You may use either days or weeks as your time unit, but you cannot enter a job shorter than one full unit. And second, *VisiSchedule* has only eight skill categories. The case study required more. To work within these limitations, I allocated a full day to each of the half-day tasks and grouped many responsibility codes into skill category 9 as a catch-all.

VisiSchedule has many nice features that I did not need for the case study. For example, it uses color very well; if you don't like the colors the program uses, you can change them to suit yourself. Also, *VisiSchedule* can interface with any program that can use a DIF file. In addition, more than one skill and more than one person can be assigned to a job. The program will use the salary rate for each skill to compute labor costs for the jobs. All reports can be previewed on the screen before printing. And for the job-oriented reports, you may select both the jobs to be included and the sequence.

The only missing feature I can think of is one that would allow you to set a maximum number of people available with a given skill, a common real-world constraint that the program cannot handle.

In summary, I think that *VisiSchedule* is an excellent project management program. It is quick, colorful, comprehensive, and classy. It certainly is one of the best Level I systems covered in this study.—**Leslie K. Brown**

The next investment in your PC should be a small one.

Free software catalog direct from IBM.

The people who brought you your personal computer now bring you a catalog of programs to make it even more useful. It's *The Directory of Personally Developed Software* and it's direct from IBM.

You'll find new programs for business, personal productivity, education, entertainment, and graphics. There are scientific and engineering programs. Even programs for programmers. All the software was written by IBM people or members of their families. People who go about their programming with a special kind of enthusiasm.

Half the programs are under $20. Some are as little as $14.95. But even the $150 programs are exceptional values. And although the catalog itself carries a $4 cover price, it's yours free if you order before December 31, 1984. Just fill out the coupon below or call:

1-800-IBM-PCSW

In Alaska or Hawaii, 1-203-237-4504.

One of the best investments you make in your PC may be the smallest.

Personally Developed Software
Post Office Box 3266
Wallingford, Ct 06494

IBM

Please rush me my copy of *The Directory*.

Name _____

Address _____

City _____

State _____ Zip _____

NAME	HARDWARE REQUIREMENTS			DOCUMENTATION	
	MEMORY	NUMBER OF DISK DRIVES REQUIRED	FIXED DISK REQUIRED	HAS TUTORIAL	GIVES SAMPLE DATA
THE CONFIDENCE FACTOR	128K	1, but 2 recommended	NO	NO	YES
DECISION SUPPORT SYSTEM	256K	1	NO	NO	YES
GANTT-PACK	128K	1	NO	NO	YES
MICROSOFT PROJECT	128K	1	NO	YES	YES
MORGAN PATHFINDER	128K	1	NO	NO	YES
PERTMASTER	128K	1, but 2 recommended	NO	YES	YES
PRO-JECT 6	128K	1	NO	YES	YES
PROJECT MANAGEMENT	64K	1	NO	NO	NO
PROJECT SCHEDULER 5000	256K	2	NO	YES	YES
TASKPLAN	96K	1	NO	NO	YES
TARGET TASK	128K	1	NO	Has examples	YES
VISISCHEDULE	128K	2	NO	YES	NO

SYSTEM CAPACITIES

NUMBER OF RELATED PROJECTS	TASKS PER PROJECT	LEVELS OF HIERARCHY	RESOURCE CATEGORIES	SCHEDULING UNITS	MAXIMUM $ AMOUNT	TASKS DISPLAYED SIMULTA-NEOUSLY
1	100	1	10	User defined time units	$10,000 per resource time unit	20
1	Depends on graph generated	1	Not applicable	Weeks, months, quarters, years	$999,999	Depends on graph generated
1	Limited by memory	2	Not defined	Days, hours, or user-defined units	Not applicable	9–10
Limited by disk capacity	128	Limited by disk capacity	64 per project, 8 per task	Days, weeks, or months	$21,000,000	19
1	3,160	1	Not defined	User-defined	Not applicable	16
Limited by disk capacity	1,000–2,500, depending on memory	1	29 per task	User-defined	User-defined units	19
1	75–250, depending on memory	1	30 per project, 5 per task	Days, weeks, or months	Billions	13
1	PERT chart, 300; Critical Path chart, 500	1	1 per task	User-defined	Not applicable	14
Limited by disk capacity	500–750	3	96	99 divisions of day, week, month	$99,990,000	18
1	50	1	1 per task	60 user-defined units	10 digits	10
1	500	1	Not applicable	Days, or user-defined	10 digits	1
1	300 with 192K, 100 with 128K	1	9	Days or weeks	10 digits	20 to 22

NAME	FEATURES				
	COPY-PROTECTED	MIXED PLANNING UNITS	CHANGES PLANNING UNITS	ON-LINE HELP	CRITICAL PATH HIGHLIGHTED
THE CONFIDENCE FACTOR	NO	NO	NO	Yes, context-sensitive	Yes, by letter C
DECISION SUPPORT SYSTEM	YES	NO	NO	Yes, context-sensitive and split-screen help	Yes, by dotted line
GANTT-PACK	NO	NO	YES	NO	NO
MICROSOFT PROJECT	YES	YES	YES	Yes, context-sensitive	Yes, by special characters
MORGAN PATHFINDER	NO	NO	NO	NO	Yes, by boldface and special symbols
PERTMASTER	YES	NO	NO	Yes, context-sensitive	User option—color, boldface, double-line, and others
PRO-JECT 6	NO	NO	NO	NO	Yes, by color on color screen, bold on monochrome
PROJECT MANAGEMENT	NO	NO	NO	NO	Yes, by asterisks next to activity
PROJECT SCHEDULER 5000	YES	NO	NO	YES	Yes, red on color screen, special characters on monochrome
TASKPLAN	NO	NO	NO	NO	NO
TARGET TASK	NO	NO	NO	Yes, menu	Yes, by asterisks
VISISCHEDULE	YES	NO	NO	NO	Yes, by double-line or color

INPUTS						
		DEFINES TASK DEPENDENCY				
CHARACTERS ALLOWED IN TASK DESCRIPTION	ALLOWS TASK ESTIMATES	AS PERCENTAGE OF TASKS COMPLETED	AS NUMBER OF TASKS COMPLETED	INSERTS TASKS	READJUSTS DEPEND-ENCIES	MULTIPLE BILLING RATES
20	NO	NO	NO	YES	YES	NO
24	NO	NO	NO	YES	NO	NO
30	NO	NO	NO	YES	NO	NO
30	NO	NO	NO	YES	YES	NO
27	NO	NO	NO	YES	YES	NO
40	NO	Yes, in time units	YES	YES	YES	NO
30	NO	NO	NO	YES	YES	NO
Numeric only	YES	NO	NO	YES	NO	NO
30	NO	NO	NO	YES	YES	NO
20	NO	NO	NO	NO	NO	NO
14	YES	NO	NO	YES	YES	NO
30	NO	NO	NO	YES	YES	NO

FOR THE IBM® PC, IBM® XT, COMPAQ,™
CORONA,™ CORONA™ PORTABLE, LEADING EDGE,® EAGLE PC,® TAVA.™

10, 20, 33 Mbyte Hard Disk Systems from $895

Kamerman Labs combines the speed and storage capacity of hard disk technology with prices you can't afford to pass up.

A dramatic leap in performance for your personal computer.

Even the smallest Kamerman Labs hard disk unit gives you 30 times the storage capacity of a typical floppy disk. Sophisticated business and professional data storage requirements can now be handled with ease.

Better yet, you can access data up to 10 times faster than with floppies. Spend more time working and less time waiting.

And it's easy to use. Kamerman Labs lets you boot directly off the hard disk, just like the IBM XT.

A complete backup solution.

Backup of hard disk data is a critical requirement in many microcomputer applications, so Kamerman Labs offers several reliable and cost-effective backup devices that are fully compatible with our hard disk units.

Lower prices than ever.

Because you deal directly with Kamerman Labs, we offer you remarkably low prices. Finally, you can realize the full benefits of hard disk technology without the excessive costs.

Tested and formatted.

All Kamerman Labs systems have been thoroughly tested and formatted before delivery.

Full warranty and technical support.

Kamerman Labs backs all its products with a full one-year warranty on both parts and labor. Plus you get prompt technical support through a toll-free hotline number.

To order, call toll-free 800-522-2237.

In Oregon, Hawaii and Alaska call **503-626-6877.**

IBM is a registered trademark of International Business Machines Corp
Compaq is a trademark of Compaq Computer Corp.
Corona is a trademark of Corona Data Systems

Leading Edge is a registered trademark of Leading Edge Products, Inc.
Eagle is a registered trademark of Eagle Computers.
TAVA is a trademark of TAVA Corporation

All Kamerman Labs Units come in either internal or external configurations

CIRCLE 220 ON READER SERVICE CARD

Kamerman Labs

8054 S.W. Nimbus, Bldg. 6, Beaverton, Or 97005
Phone 503-626-6877

© 1984 Cosmos Inc.

Revelation. Because the object is to win.

Winning isn't easy when you have to work harder than your PC because your relational database falls short.

That's why experienced users power their PC's with the Revelation® "Applications Environment" from Cosmos.

More than a relational database. Revelation gives you the tools and flexibility you need to prototype and develop even the most exotic microcomputer applications with relative ease and efficiency. Revelation uses plain English to create files, fields, entry screens and menus, process information, make simple inquiries or generate complex reports.

Revelation's R/DESIGN applications generator does the work for you, or you can switch to Rev's structured R/BASIC language for precise program customization. You can make changes in programs, screens or data structures in a matter of seconds without having to start from scratch.

Revelation works with MS/DOS™ so you can take advantage of all your favorite microcomputer software packages, and Rev's "Open Environment" communications concept allows interactive access to many mainframe and minicomputer systems. Networking and runtime versions are also available.

When you need more than a simple database, Rev up your PC with Revelation, the "Applications Environment" from Cosmos.

Contact us by phone or write and we'll arrange an unforgettable demonstration for you with a Cosmos representative in your area.

MS/DOS™ of Microsoft Corp.

CIRCLE 218 ON READER SERVICE CARD

COSMOS™

Cosmos Inc. 19530 Pacific Highway S. Seattle, WA 98188, (206) 824-9942

NAME	OUTPUTS				
	PROJECT PLAN/TASK LIST	NETWORK ANALYSIS	GANTT CHART	PERT CHART	RESOURCE LIST
THE CONFIDENCE FACTOR	Yes, on screen and printer	NO	Yes, on screen and printer	NO	Yes, on printer
DECISION SUPPORT SYSTEM	Yes, on screen and printer	NO	Yes, on screen and printer	Yes, on screen and printer	NO
GANTT-PACK	Yes, on screen and printer	NO	Yes, on screen and printer	NO	NO
MICROSOFT PROJECT	Yes, on screen and printer	NO	Yes, on screen and printer	NO	Yes, on screen and printer
MORGAN PATHFINDER	Yes, on screen and printer	NO	Yes, on screen and printer	NO	NO
PERTMASTER	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	NO	Yes, on screen and printer
PRO-JECT 6	Yes, on screen and printer	NO	Yes, on screen and printer	NO	Yes, on screen and printer
PROJECT MANAGEMENT	Yes, on screen and printer	Yes, on screen and printer	NO	NO	NO
PROJECT SCHEDULER 5000	Yes, on screen and printer	NO	Yes, on screen, printer, and plotter	NO	Yes, on screen and printer
TASKPLAN	Yes, on screen and printer	NO	NO	NO	NO
TARGET TASK	Yes, on screen and printer	Yes, on printer	Yes, on printer	NO	NO
VISISCHEDULE	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	NO	Yes, on screen and printer

						VENDOR SUPPORT
FUNDING SCHEDULE	MANPOWER LOADING	HOLIDAY CALENDAR	SUB-CONTRACTS	UPDATED PROJECT PLAN	UPDATED NETWORK ANALYSIS	HOT-LINE TECHNICAL SUPPORT
NO	Yes, on printer	NO	NO	NO	NO	YES
Yes, on screen and printer	Yes, on screen and printer	NO	NO	Yes, on screen and printer	NO	YES
NO	NO	NO	NO	YES	Yes, on screen and printer	YES
NO	Yes, on screen and printer	Yes, on screen and printer	Yes, on printer	NO	NO	YES
NO	NO	NO	NO	NO	NO	YES
Yes, on printer	Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	NO	NO	YES
Yes, on screen and printer	Yes, on screen and printer	NO	Yes, on screen and printer	NO	NO	YES
NO	NO	NO	NO	NO	NO	YES
Yes, on screen, printer, and plotter	Yes, on screen, printer, and plotter	Yes, on screen, printer, and plotter	NO	Yes, on screen and printer	NO	YES
Yes, on screen and printer	NO	NO	NO	NO	NO	YES
NO	NO	Yes, on screen and printer	NO	NO	NO	YES
Yes, on screen and printer	Yes, on screen and printer	Yes, on screen and printer	NO	NO	NO	YES

Copyrighted material

NAME	INTERFACING		BUYING INFORMATION		
	WITH OTHER FAMILY SOFTWARE	WITH OTHER TYPES OF SOFTWARE	LIST PRICE	DEMO VERSION AVAILABLE	AVAILABLE OUTSIDE OF U.S.
THE CONFIDENCE FACTOR	Yes, with *Project Master*	NO	$389	YES	YES
DECISION SUPPORT SYSTEM	NO	NO	$895	YES	NO
GANTT-PACK	NO	Yes, with Lotus's *1-2-3*	$395	YES	NO
MICROSOFT PROJECT	Yes, with *Multiplan* chart	Yes, with DIF, *dBASE*, SYLK	$250	YES	YES
MORGAN PATHFINDER	NO	NO	$80	YES	Canada
PERTMASTER	NO	NO	2,500 activities, $895, 1,500 activities, $695	YES	Only from company
PRO-JECT 6	NO	NO	250 tasks, $199 150 tasks, $149 75 tasks, $99	YES	Only from company
PROJECT MANAGEMENT	NO	NO	$170	NO	Only from company
PROJECT SCHEDULER 5000	NO	Yes, with DIF format output	$395 with graphics, $345 without	NO	YES
TASKPLAN	NO	NO	Free; $20 contribution suggested	NO	Only from company
TARGET TASK	NO	NO	$329	To dealers only	U.K.
VISISCHEDULE	Yes, to VisiCorp programs via DIF	Yes, with DIF format output	$195	NO	France

The IBM™ Multi-User System: The Multi-PC.

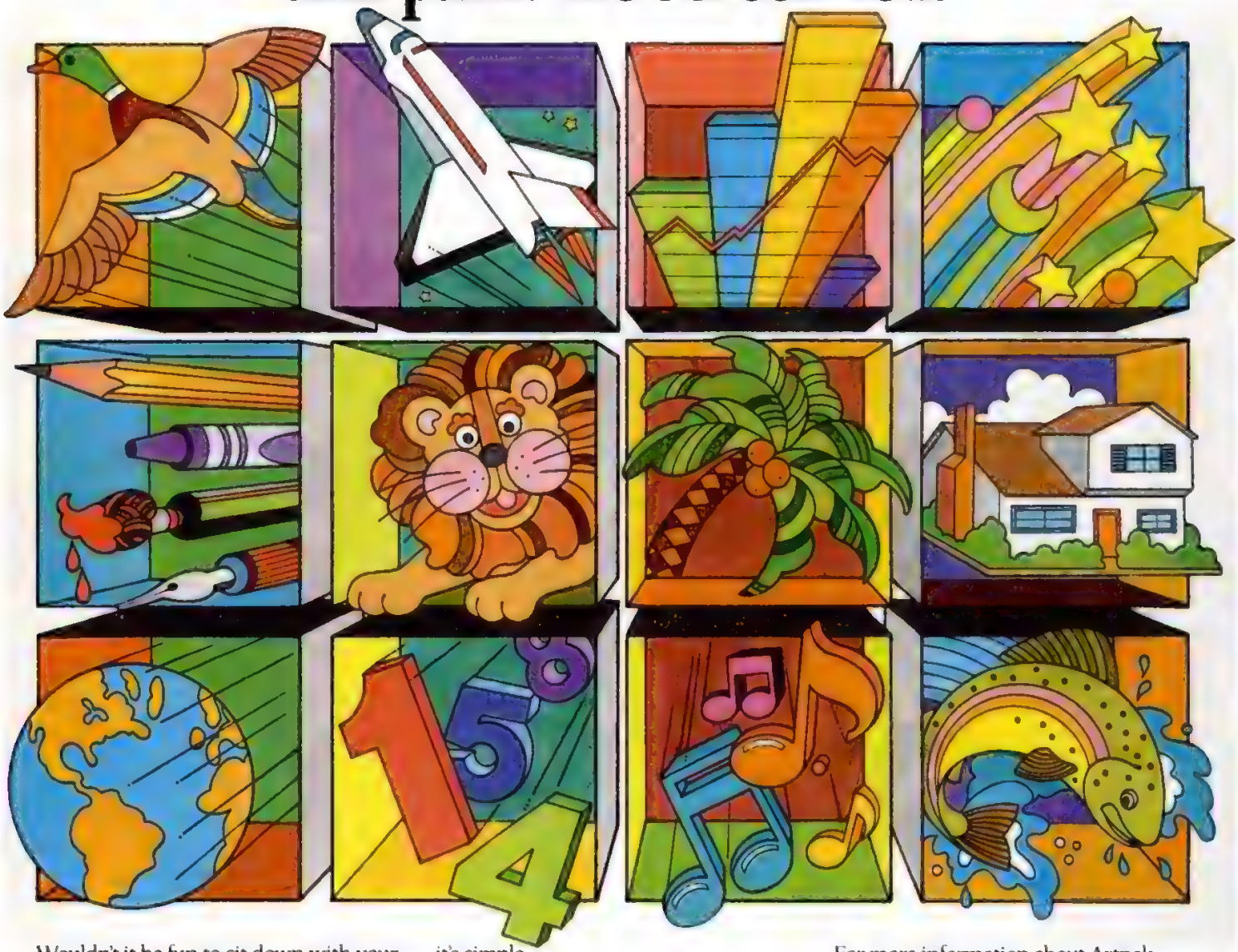
Whether you are using an IMB PC or XT, the Anex Multi-PC easily expands your computer into a true multi-user system. Up to four users can share a single PC, all running the same or different applications all under PC-DOS, all at the same time, all using existing monochrome color and graphics oriented software. There's nothing to throw away.

The Multi-PC gives everyone **in your office the convenience of having their own PC, plus the substantial benefits of shared resources. It makes a productive office out of a productive desk** at half the price of four individual PC's.

Call us to find out how you can get the most out of your IBM PC. Anex Technology, Inc.
151 North Route 9W, Congers, New York 10920
(914) 268-2400
For dealer information, call 1-800-821-4826

ANEX

Design little creatures, draw floorplans, create animated cartoons, illustrate stories, illuminate graphs, make crazy doodles, and paint the screen red.



Wouldn't it be fun to sit down with your family tonight and create a full-length cartoon—right on your computer screen?

Introducing Artpak. There's nothing in the world like it.

It lets you draw anything you can dream up—and make it flip, dissolve, turn, blink, and disappear. In color!

Then, believe it or not, you can write your own musical score. Got the picture?

And you don't have to be an expert—in computers *or* art—to have a ball with Artpak. It's so sophisticated, it's simple.

When you want to get serious you can use Artpak to create business presentations, flowcharts, diagrams, graphics and architectural layouts. Then print them all out.

However, we maintain that you should own Artpak simply because it's so much good, old-fashioned creative fun.

But you can draw your own conclusion.

Available for: IBM PC/XT and PCjr

Price: $99

For more information about Artpak and the location of your nearest Artpak dealer, call us today.

Artpak™

PalSoftware Corp.
6100 Barrows Dr.
Los Angeles, CA 90048
213/259-9659 213/936-7707

PALSOFTWARE

Artpak is a registered trademark of PalSoftware Corp IBM PC XT PCjr are registered trademarks of International Business Machines Corp

CIRCLE 540 ON READER SERVICE CARD

A Family Album

CIRCLE 231 ON READER SERVICE CARD

The IBM PC Family

The IBM Personal Computer
Founder of the family

Our growing family

These relatives not only bear a strong family resemblance, they share strong family traits. They're all hardworking, helpful, friendly, and have a good memory for facts and figures. All in all, quite a compatible group.

IBM Portable PC
Carrying on the family tradition

IBM Personal Computer AT
The most powerful IBM PC ever

Little Tramp character licensed by Bubbles Inc., s.a.

Copyrighted material

IBM PC/XT
the PC's sophisticated first cousin

IBM PC jr
growing by leaps and bounds

IBM PC Network
the tie that can bind the many members of the family together

Friends of the family

For an authorized dealer or IBM Product Center near you, call 1-800-447-4700. In Alaska or Hawaii call 1-800-447-0890.
For information from IBM about the IBM 3270PC or the IBM PC/XT/370, call 1-800-IBM-2468, ext. 10.

CIRCLE 231 ON READER SERVICE CARD

TeleVideo. The color PC with a black and white price.

Now, brilliant, high resolution color comes standard with the new TeleVideo® Color Personal Computer. At a price that's about the same as the IBM® monochrome system.

In fact, to match TeleVideo's color on an IBM PC, you'd have to add a color monitor, plus a color and graphics adaptor board. And unlike IBM, the TeleColor PC has memory that's dedicated to the color screen. So you get a faster, flickerless image that's easier on your eyes.

What's more, the TeleColor PC also comes with the popular PC™-DOS compatible operating system and three essential business software programs—word processing, spread sheet and data base management.

It also has standard features that make it easier to use than an IBM PC. Like a tiltable monitor and a keyboard that's exceptionally comfortable to use.

And, of course, the TeleColor PC runs the same popular software as the IBM PC.

Contact the TeleVideo dealer nearest you for a demonstration of the color PC with a black and white price. Call 800-538-8725 (in California, 408-745-7760).

Standard Features

- Word processing, spread sheet and data base software
- Color and graphics display
- 12 inch tilt color screen
- 256 Kbyte RAM
- Two 360 Kbyte slim-line floppy disk drives
- RS-232C serial port
- Parallel printer port
- Composite video port
- Internal expansion bus slot
- GW BASIC® programming language
- Self-running demonstration diskette
- PC-DOS compatible

The best hardware for the best software.

TeleVideo

Personal Computers
TeleVideo Systems, Inc.

Northwest (408) 745-7760 Southwest (714) 476-0244 Southcentral (214) 258-6776 Midwest (312) 397-5400
Southeast (404) 447-1231 Mid-Atlantic (703) 556-7764 Northeast (617) 890-3282 East (516) 496-4777 Rocky Mountain (408) 745-7760

IBM is a registered trademark of International Business Machines. GW BASIC is a registered trademark of MicroSoft Corporation. PC-DOS is a trademark of International Business Machines.

CIRCLE 223 ON READER SERVICE CARD

ONE LANGUAGE. ONE SOLUTION.

PC/FOCUS

PUT THE DATABASE POWER OF A MAINFRAME IN YOUR PC.

Now you can turn your Personal Computer into a mainframe-level applications development system with **PC/FOCUS,** the most powerful DBMS available for your PC.

As a tried-and-proven, user-friendly, 4th generation system, PC/FOCUS gives you the ability to query and report from files, build systems and manipulate data. It incorporates a relational database, screen manager & report writer, and offers dramatic abilities in graphics, financial modeling and statistical analysis.

But unlike older database technologies which require training and practice to master, PC/FOCUS uses simple English statements you can learn in minutes! In fact, just a few moments of familiarization with **TableTalk,**™ its new natural language window, is all that's needed for even a novice to become immediately productive.

Best of all, PC/FOCUS lets you download data extracted from mainframe files and DB's, then upload data and procedures from the PC to the mainframe for production execution. So your PC becomes almost as powerful as a mainframe, and you become almost as capable as a trained systems analyst.

Let PC/FOCUS with TableTalk™ unlock the mainframe power hidden within **your** PC. For details, fill out and mail the coupon or write to **Don Wszolek, Dept. P15, Information Builders, Inc., 1250 Broadway, New York, NY 10001.**

Dear Don;
Yes! I'd like to unlock the mainframe hidden in my PC with **PC/FOCUS**. Mail full details to:

NAME_____

COMPANY_____

TITLE_____

ADDRESS_____

CITY_____

STATE_____ ZIP_____

TELEPHONE_____

INFORMATION BUILDERS, INC.

New York: (212) 736-4433 • Washington, D.C.: (703) 276-9006 • St. Louis: (314) 434-7500 • Chicago: (312) 789-0515
Dallas: (214) 659-9890 • Palo Alto: (415) 324-9014 • Los Angeles: (213) 615-0735 • Houston: (713) 952-0260

Dealer Inquiries Invited.

CIRCLE 198 ON READER SERVICE CARD

Supercharged Turbo Pascal

This dynamic new language compiler is a "VolksPascal," with most of the power of Pascal plus a few extras. It introduces a new programming environment and runs like magic.

A Post Office poster warns against mail fraud, "If it sounds too good to be true, it probably is." I'll bet that many people recalled that warning as they read Borland International's first ads for Turbo Pascal late last year: a complete native-code Pascal language compiler with its own built-in *WordStar*-like full-screen text editor, the whole lot occupying 33K RAM and costing $49.95.

I didn't believe it either. Of course, I had reason, having just given up on JRT Pascal, which was offered for CP/M-80 computers 3 years ago at $29.95. The CP/M-80 world went crazy ordering it. The problem was, it was a terrible compiler. Besides doing great harm to the Pascal language definition, it was a bug farm, locking up my CP/M-80 computer several times an evening. Not surprisingly, JRT Systems went bankrupt late last year.

A co-worker had to shake me by the shoulders, urging me to get Turbo Pascal for my own PC. I finally ordered it. Three days after receiving it, I was a believer. Turbo Pascal will run on any PC with 64K RAM and a single disk drive. It will also run on the standard disk-based (but not cassette-based) PC*jr*. Although I have not tested Turbo on the PC*jr*, I have heard good reports from someone who refuses to program using anything else. Turbo's small size and compact output code files are very appropriate for the PC*jr*'s limited resources.

A language compiler is a tool you use to write programs. A programming environment is the whole interlocking process of bringing a program out of your head and into action on your computer. It includes the compiler and the compiler's support equipment: a text editor, debugger, linker, and so on.

The really magical thing about Turbo Pascal is that it applies a whole new concept in programming environments for PC-DOS. The distinction may be lost on those of you who do not program in a compiled language like Pascal or C; so let me first explain what a traditional programming environment is like.

You begin with an idea for a program. The first step is to plan the program carefully, making sure that you fully understand the program's purpose and its limits before trying to define its methods.

Once you've planned the program (possibly using an outlining tool like *ThinkTank*), you bring up a text editor (one somewhere on the spectrum from EDLIN to *WordStar*) and write a source program. This program is simply a text file, with words like

```
FOR X := 1 TO 100
  DO WRITELN(STRING
  _ARRAY[I]);
```

You then save your source program as a disk file, and exit the text editor back to PC-DOS.

Next you must execute a compiler program. A typical Pascal compiler is Digital Research's Pascal/MT+86. The compiler program reads your source file from disk and translates it into a "relocatable object file," which is written out to disk. This process can take a long time. Pascal/MT+86 can take nearly 10 minutes to compile large, complicated programs with several thousand lines.

The compiler program spots errors in your source program. If any errors exist, you must exit the compiler program to DOS, reload your text editor, and edit the errors out of your source program. You must repeat the edit/compile/spot errors cycle until you can find no more errors.

Next, you must "link" the relocatable object file into a program file that can be run. A linker program takes your relocatable file and fills in some blanks with standard library routines included with the compiler. You can load the file that it finally writes to disk and run it like any other computer program.

Of course, there's no guarantee that your program will run correctly. In fact, it may contain run-time errors, which can bring your PC to a sudden halt. In that case you must reboot the PC, bring up your text

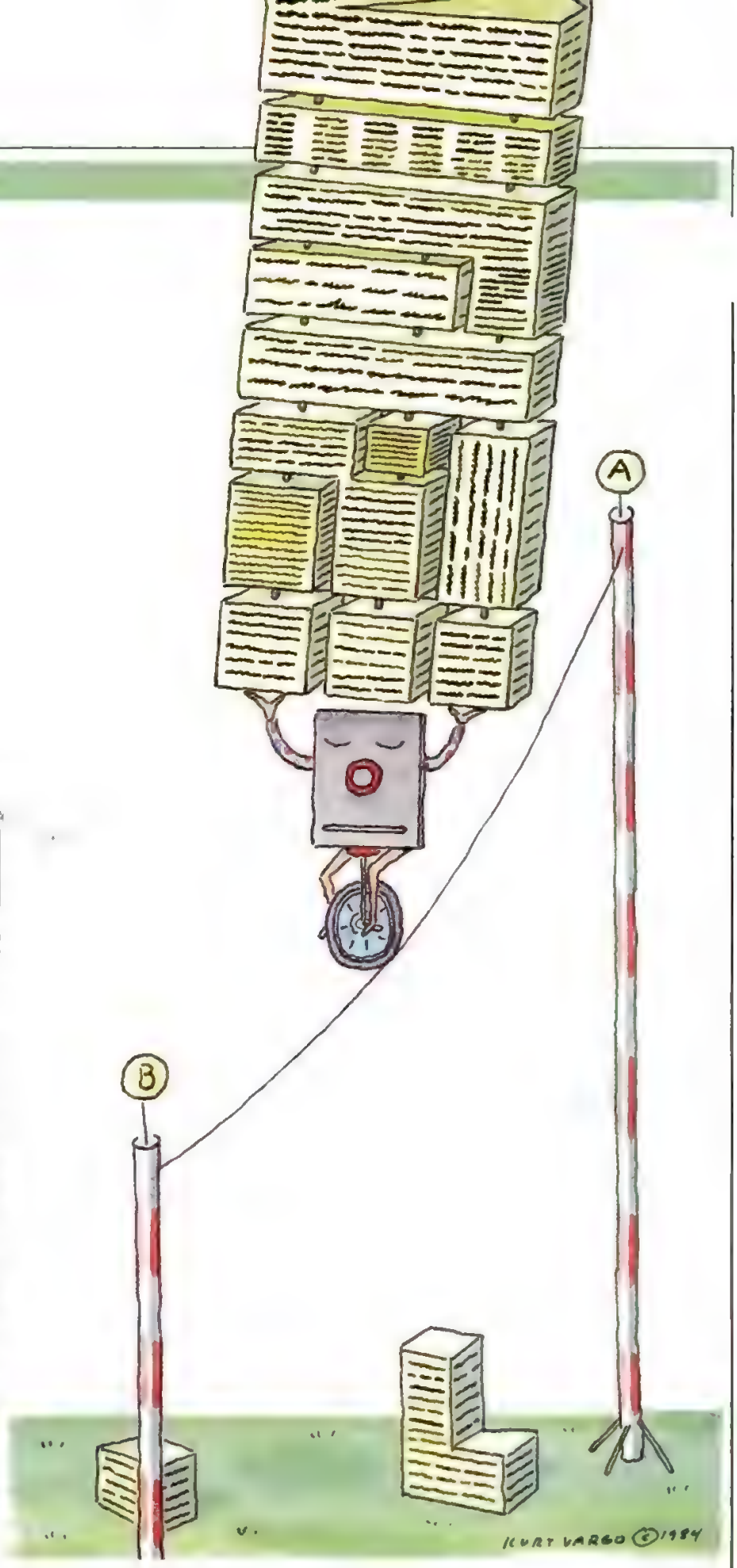


Illustration: Kurt Vargo

editor, and begin the cycle again.

In summary, you must plan, and plan well. Then repeat: Edit source; compile source. Continue until the compiler finds no more errors. After that, link the program with the necessary code libraries. Finally, run the program. If it fails, repeat the process.

My experience with Pascal/MT+86 has shown that a complete cycle takes a minimum of 3 to 4 minutes even for trivial 35-line toy programs. For a serious 1,000-line application, figure 15 to 30 minutes per cycle. Much of that time is spent staring helplessly at your machine as it grinds away writing intermediate files to disk—an odious waste of your time.

Everything You Need

Enter Turbo Pascal, a one-piece environment. A single PC-DOS program—TURBO.COM—has everything you need to create programs.

When you run TURBO.COM, a menu appears on your screen. The Turbo menu is the jumping-off place for the entire programming environment. You do not have to drop down into PC-DOS for anything. In fact, if you have at least 128K RAM, you can create and test small to middling programs without ever writing anything to disk. Subject to the limits of your PC's configuration, Turbo Pascal does everything within RAM. Your source program is in RAM. Your object program is in RAM. The editor is in RAM, as is the compiler. No disk I/O is required.

First off, that means fast. When you begin to edit a program, you don't have to wait for the program to load in from disk, configure itself, and finally appear on your screen. Press E and wham! you're editing your source code. A two-character *WordStar* command (good old Ctrl-K-D) brings you instantly back to the Turbo menu. Pressing S saves your edited source program to disk (not strictly necessary, but it's foolish not to save to disk after each change to your source). Pressing C compiles your source code into object code. Again, you do not load the compiler program from disk; it's already there, ready to begin crunching instantly.

The compiler is dazzlingly fast. Its speed is partly due to the fact that it's reading source from RAM and writing object to RAM; RAM is hundreds of times faster than floppy disks. But the compiler is obviously written by a true wizard of assembly code. In all my years using microcomputers (all the way back to 1978 and the days of the Compucolor II), I have never seen a compiler work so quickly. Even when writing a code file to disk, an easily selected menu option, it can compile a 1,000-line program in seconds. Small toy programs literally compile too quickly to follow in a second or less.

> Turbo Pascal's programming environment could apply to virtually any programming language.

Say the compiler locates an error in your program. Here's where some of the magic of the Turbo environment comes in: Press Esc and Turbo brings up its text editor, the cursor resting where it thinks the error lies. And the compiler is usually right.

Maybe you lost a semicolon or made one of those other famous Pascal errors. Three keystrokes can often fix it. Then it's Ctrl-K-D to the menu, and C to compile again. You can be out of the compiler, into the editor to fix an error, and back out to the compiler in less than 5 seconds.

In time your program will compile without errors. The compiler will then automatically bring you back to the menu. Press R and instantly your program is running. Once again, the magic environment comes into play: If a run-time error occurs, Turbo searches your source code for the location of the object-code error, brings up the text editor, and again puts the cursor where it thinks the problem lies.

That trick took my breath away. You can repair, save, recompile, and run a simple run-time error (spelling a file name incorrectly, for example) in as little as 15 or 20 seconds.

Once you have chased all the bugs out of your program, you can save the program file out to disk as a .COM file. Then you don't need the Turbo environment anymore to run the program; simply call the program from DOS as you would any other .COM program. There's no p-code interpreter program hanging like an albatross from your own program's neck, as with UCSD Pascal.

About one-third of the speed of the Turbo programming environment is due to its working from RAM to RAM. Another third comes from not having to duck out to PC-DOS after executing each programming tool. The final third is the result of the excellent software engineering that went into the design of the Turbo product.

Nothing like Turbo Pascal has ever existed for PC-DOS before. The only thing that even comes close is PC BASIC.

Pascal Isn't BASIC

Turbo Pascal's programming environment could apply to virtually any programming language. Nothing in it is tied to Pascal. In fact, Borland International has made no secret of its development of a Turbo C and a Turbo Modula 2 system for release later this year, and we can expect them to operate within a similar program-

PC PRODUCT

Turbo Pascal V2.0
Turbo87 Pascal V2.0
Borland International
4113 Scotts Valley Drive
Scotts Valley, CA 95066
(408) 438-8400
List Price: Turbo Pascal, $49.95; Turbo87 Pascal, $89.95

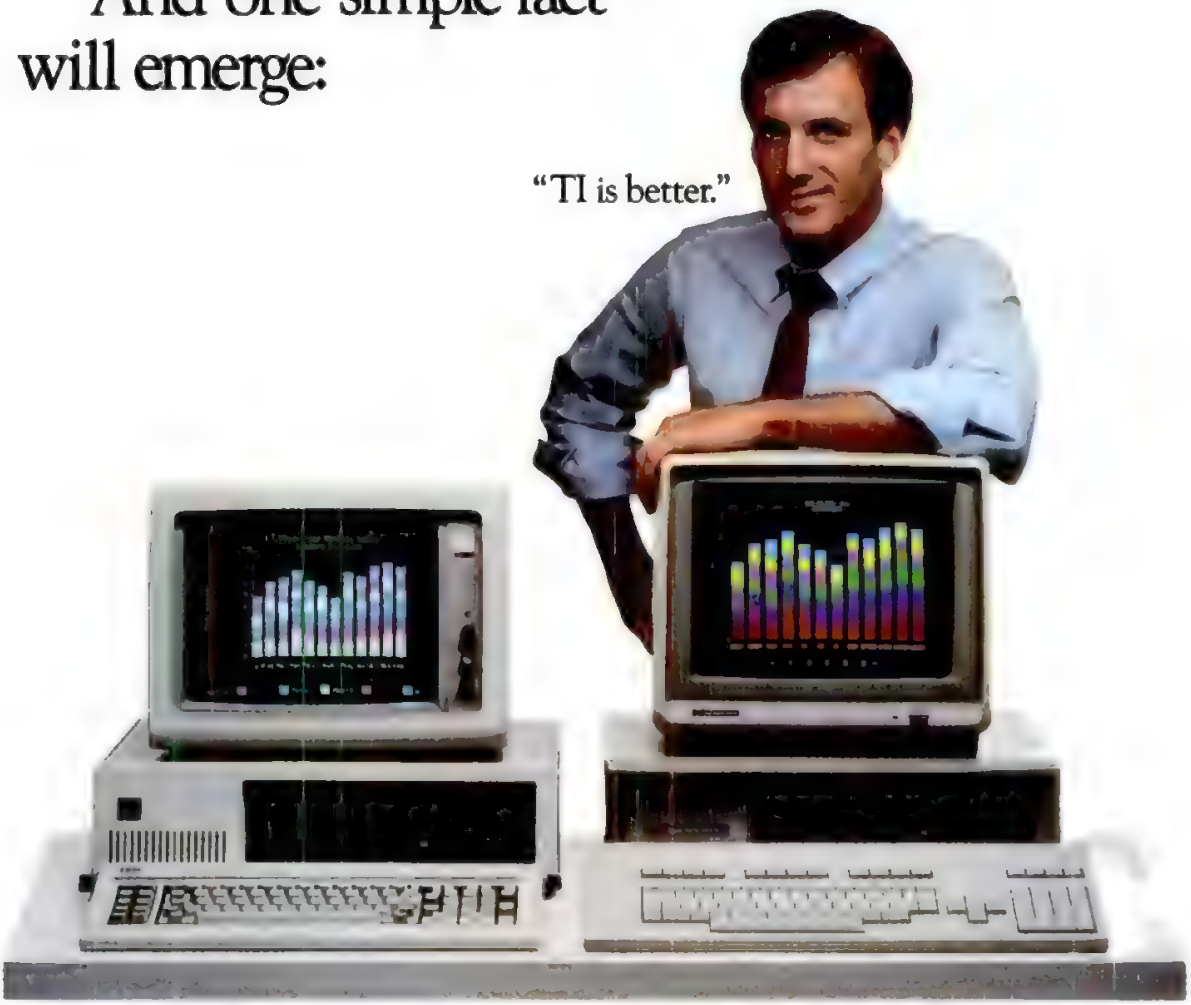
CIRCLE 740 ON READER SERVICE CARD

Dare to Compare. Come in. Sit down. Run both PCs. IBM vs. TI. Side by side. Compare how they run powerful software. Like 1-2-3™ from Lotus.™ Or BPS Business Graphics.™ Or MultiMate.™

Compare speed. Keyboards. Graphics. Service and support. Compare everything a PC can do for you.

And one simple fact will emerge:

"TI is better."



IBM Personal Computer (1-2-3 from Lotus)

Texas Instruments Professional Computer (1-2-3 from Lotus)

Take TI's "Dare to Compare" challenge today. Selected dealers want you to see for yourself how the TI Professional makes the best software perform even better. You'll also learn how TI backs you with outstanding service and support, including an optional 24-hour customer support line and extended 1- or 5-year warranties. Call us toll-free at 1-800-527-3500 for your nearest TI dealers.

TEXAS INSTRUMENTS

Creating useful products and services for you.

IBM is a trademark of International Business Machines, Inc. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. BPS Business Graphics is a trademark of Business & Professional Software, Incorporated. MultiMate is a trademark of SoftWord Systems. Copyright © 1984, Texas Instruments Incorporated.

2764-48

ming environment. For now, however, we have Pascal.

What *is* Pascal? As a block-structured programming language, Pascal (unlike BASIC, which is line-structured) is organized into "blocks." These blocks are sequences of instructions framed within BEGIN/END keywords. All Pascal programs have a common structure: A single program block at the bottom of the program invokes function and procedure blocks, which are defined above it in the

After Turbo, the Deluge

Vendors have had a field day scrambling to release products to enhance and explain Turbo Pascal. Here are the best so far.

It happens frequently enough in our whirlwind industry: A successful software product spawns enhancements, add-ons, and publications by third-party vendors reaching for a piece of the action. But never before have so many people climbed on the coattails of something so arcane as a Pascal compiler.

Turbo Pascal, more than 100,000 copies of which have been sold to date, has developed an aftermarket. Borland International itself started it off a few months ago with the *Turbo Toolbox*, a collection of sorting and searching routines based on Quicksort and binary trees, perhaps the fastest methods of sort and search yet devised for small computers. (They're the same methods *dBASE II* uses to keep its files in order and process queries.) The *Toolbox* routines are written in Turbo Pascal and sold in source code form, so you can use them and understand how they work. Borland's Phillipe Kahn says of the *Toolbox*, "If people can't make *dBASE II* do what they need it to do, now they can write their own database."

Turbo Pascal's graphics abilities are not as stellar as those of IBM Advanced BASIC. But Metagraphics, Inc., of Mountain View, California, modified its $150 *MetaWindow* graphics library for use with Turbo Pascal. *MetaWindow* offers viewports, pull-down windows, fill patterns, polygon draw, graphics GET and PUT, proportionally spaced text fonts, full-color control, and mouse interface, as a collection of machine code subroutines. The package supports the IBM graphics adapter as well as Hercules, Tecmar, AST, CCS, and STB. Since Turbo Pascal cannot link with library routines, a modified Turbo version of *MetaWindow* loads above PC-DOS and can be called through a vector in low memory. It is the only way I know of to do advanced graphics from Turbo Pascal. It lacks only ELLIPSE and DRAW of BASICA's graphics power. My testing has found it fast and reliable.

Systems Management Associates of Raleigh, North Carolina, has released a PC DocuMate keyboard template for Turbo Pascal. It lists and briefly describes all of Turbo's built-in procedures and functions, along with compiler directives, reserved words, color tables, operators, and standard devices. The worst part of learning any language is thumbing through the manual to determine how many parameters (and in what order) to give a procedure. SMA's $14.95 Turbo Pascal DocuMate eliminates that annoyance.

Turbo Pascal has a user group, called TUG, that publishes a bimonthly typeset newsletter, *TUG Lines*, edited by John Craig. *TUG Lines*, usually 25 pages long, includes letters asking for help, software contributions, beginners' tutorials, and technical advice. Its contributors are the more than 2,500 avid Turbo Pascal users. TUG membership costs $20 a year, which includes six issues of *TUG Lines*.

Brady Communications, Inc., in Bowie, Maryland, is publishing a second edition of *Pascal for the IBM PC* by Kevin W. Bowyer and Sherryl J. Tomboulian that will include specific information on Turbo Pascal. It's scheduled to appear early in 1985. —**J.D.**

FACT FILE

Turbo Toolbox
Borland International
4113 Scotts Valley Drive
Scotts Valley, CA 95066
(408) 438-8400
List Price: $49.95

CIRCLE 739 ON READER SERVICE CARD

MetaWindow
Metagraphics
444 Castro St., Suite 400
Mountain View, CA 94041
(415) 964-1334
List Price: $150

CIRCLE 738 ON READER SERVICE CARD

TUG Lines
John Craig, Editor
P.O. Box 548
Silverdale, WA 98383
List Price: $20 a year membership

CIRCLE 737 ON READER SERVICE CARD

Pascal for the IBM PC
Kevin W. Bowyer and Sherryl J. Tomboulian
Brady Communications, Inc.
Bowie, MD 20715
(301) 262-6300
Copyright: 1983
Cover Price: $17.95
ISBN 0-89303-280-8

CIRCLE 736 ON READER SERVICE CARD

You've seen the Macintosh, now see PC Paintbrush

PC Paintbrush

After many months of testing, ZSOFT Corporation is pleased to announce the versatile, colorful, PC Paintbrush.

Not just 2 colors, but 4, 16, or even 256 colors. Not just 320x200 resolution, but 640x200, 640x400, 720x350, 720x704, or more (depending on display adapter).

PC Paintbrush is available NOW for the IBM PC and compatibles, with 192K of memory and DOS 2.0 or above. We support an astonishing variety of hardware; check the lists below. Soon: HP150 and Corona 640x325 versions.

For Business, too

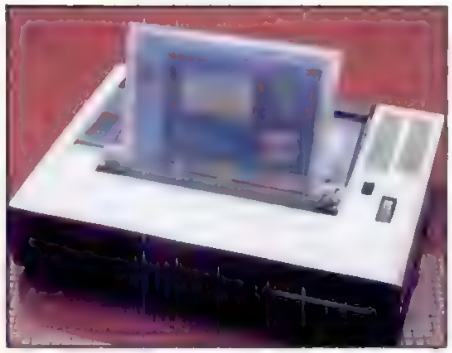
Besides being lots of just plain fun, we've designed PC Paintbrush for serious business. Our character sets (all 6 of them) are the best looking in the industry. Our printout is second to none.

Want to improve humdrum bar graphs? With PC Paintbrush, you can grab a chart or graph from another program (such as Lotus' 1-2-3 or Soreim's SuperCalc3), then embellish it with PC Paintbrush. Take a plain 2 or 4 color bar graph and produce a stunning 16 color slide or printout (requires appropriate display adapter)

We offer special group licensing agreements, as well as inexpensive customization services for your business' special requirements.

Astonishing Resolution

No need to buy additional hardware. We've made sure that PC Paintbrush will work with your printer, your display, and your application.



You can print on B/W printers from IBM, Epson, NEC, Okidata, C-Itoh, and Gemini; or color printers from Diablo, Tektronix, PrintaColor, Hewlett Packard (HP7475 Plotter), Quadram, and Transtar. With the color printers, pick from 25 different colors. With black and white printers, pick from 16 different shading patterns. Color printers never looked so good.

The display possibilities with PC Paintbrush are equally amazing. We COMPLETELY support display cards by Amdek, Quadram, Tecmar, Hercules, IBM, Mindset Scion, and even the PCjr 16 color display Just imagine 640x480 resolution in 16 brilliant colors (that's 9 times the resolution of the IBM color card!), or 720x704 resolution in 3 shades of grey.

Blinding Speed

You hate waiting and so do we. All of our graphics are written entirely in assembler, for the fastest possible results.

We provide Products, not Promises

No promises, just fact: we are currently shipping PC Paintbrush.

All ZSOFT software comes with a real warranty, and our service is second to none. Just ask some of our customers (such as IBM, Sohio, Michelin, Salomon Bros., Sperry, Westinghouse, U. of Pittsburgh . . . shall we go on?).

For those interested in updates, a single small fee entitles you to updates for one year; no catch: no additional costs, no need to return diskettes, no postage fees.

Schools

Schools and universities please call for educational discounts.

Z·SOFT

370 HERMITAGE CT. SW
MARIETTA, GEORGIA 30064 • 404-425-3766

Macintosh is a registered trademark of Apple Co.
PCjr is a registered trademark of IBM.

CIRCLE 206 ON READER SERVICE CARD

source file. Execution of code in blocks runs from top to bottom. GOTO branching, while allowed, is discouraged. Pascal programs have a clean, readable flavor, which BASIC approaches only when in the most skilled hands.

Pascal has a small but powerful repertoire of instruction statements. IF/THEN/ELSE, WHILE/DO, REPEAT/UNTIL, CASE/OF, and FOR/DO, for example, control program flow; READ/READLN and WRITE/WRITELN send output to your screen, printer, or disk files. These statements operate on simple data types and structures built from those data types: characters, integers, real numbers, Booleans, arrays, sets, and various combinations thereof, grouped into records.

The Pascal language definition is "lean and mean." Simpler than BASIC and more organized, it resembles the *dBASE II* command language in some respects. People who are fluent in *dBASE II* should have no trouble learning Pascal. BASIC is a portmanteau language, into which everything but the kitchen sink has been thrown willy-nilly, with little thought as to how the whole thing fits together. You can use BASIC for years without ever using *all* of it, but Pascal naturally draws you into contact with the entire language definition. BASIC is amorphous; Pascal is crystalline.

Not Exactly Pascal

Turbo is, in fact, both more and less than Pascal. A handful of features in the Pascal language definition are not present in Turbo Pascal. Turbo lacks disk file GET and PUT. In the interest of keeping Turbo Pascal small and fast, the function of GET and PUT is carried by READ and WRITE instead. GET and PUT are virtually always the slowest form of file I/O available in a Pascal compiler, and so this feature is a problem only when you are attempting to compile code written for another compiler under Turbo Pascal.

It also lacks procedural parameters. I regret that Turbo Pascal cannot pass functions or procedures as parameters.

Also, Turbo's GOTO statements cannot leave the current block. In other words, you cannot jump from inside a procedure to inside another procedure, or to inside the main program. All in all, this is a good thing. GOTOs have their uses, but jumping from block to block is not one of them.

That's all Turbo doesn't offer. Everything else possible with the Pascal language definition is possible in Turbo.

Of all IBM PC compilers, Turbo Pascal has the best repertoire of tools for accessing PC-DOS.

Extensions of Pascal

Many of Turbo's features extend Pascal. All its extensions point toward the creation of useful, reasonably portable applications packages. One of its major extensions is its dynamic strings. Turbo closes Pascal's biggest hole the same way UCSD Pascal and Pascal/MT+ do, by supplying strings whose length can vary according to what you load into them. Turbo also includes a set of string-handling procedures identical to those of Pascal/MT+: LENGTH, COPY, POS, CONCAT, INSERT, and DELETE. In addition, Turbo has an STR function to convert a numeric value into its string equivalent, and VAL to extract a numeric value from a string variable. To my knowledge, no other Pascal includes VAL and STR.

Terminal control is another of Turbo's major extensions. It includes a set of terminal control procedures for screen formatting: CLRSCR clears the screen; CLREOL clears from the cursor to the end of line; GOTOXY (*X, Y*) positions the cursor to *X, Y*; DELLINE deletes the line containing the cursor; and INSLINE inserts a line at the cursor position. It moves down the old cursor line and the lines below it. No other PC-DOS Pascal includes any kind of terminal control. A hidden advantage here is that Turbo Pascal has been implemented on a great many microcomputers in addition to the IBM PC. You can compile a carefully written program using Turbo's standard screen controls and run it identically on dozens of diverse machines. I have compiled and run a simple full-screen file editor without changes on the IBM PC, the Xerox 820, the Victor 9000, and the Zenith Z100. You really can't get a whole lot more diverse than that. DP managers who must support in-house software for a number of incompatible microcomputers might find Turbo Pascal the key to devising "one source fits all" programs.

Turbo also offers random file I/O and block file I/O. Random file I/O is the ability to read or write any record in a file without scanning through the entire file from the beginning. Turbo has a SEEK procedure identical to that of UCSD Pascal. Turbo also allows high-speed access to files in blocks of 128 bytes, using BLOCKREAD and BLOCKWRITE procedures similar to those of Pascal/MT+ and UCSD Pascal.

Another extension of Turbo involves its graphics and sounds. Turbo Pascal for the IBM PC allows some graphics and sound control (available only on this version). The graphics statements allow you to plot points and draw lines. You have full control of color in both text and graphics modes. This version includes a primitive windowing function, which defines a rectangular area; it sends drawing that you do only within the window to the screen. Turbo graphics do *not* include such BASICA graphics statements as CIRCLE, graphics GET and PUT, VIEWPORT, DRAW, and PAINT. The only serious omission here is that of the graphics GET and PUT, without which serious graphics work is impossible. (I felt the loss so keenly that I hired a college student to write GET and PUT for me in assembly language.) A SOUND statement produces a

When you're under the gun to get the job done, where can you turn?

pac micro™

When you need it on time and on the money

The pressure's always on to get the job done, whether you're building a bridge or getting out the company newsletter. There's only so much time and just so many people to do the work. And nobody wants to hear that it can't be done.

Enter PAC MICRO, a project management software tool from AGS Management Systems. It was created for the IBM® PC (and compatibles) to help you know how to do the job, how long it will take, and what it will cost.

Easy to use— but powerful

All you have to do is tell PAC MICRO what you want to do and in what sequence. PAC MICRO does the rest. And it's all done in simple, uncomplicated English. It lets a manager plan and schedule resources (people, equipment, dollars), as well as let you constantly track progress so you always know what's happening. PAC MICRO's scheduler uses the critical path method, allows an unlimited number of projects and up to 400 tasks per project. It shows you the critical aspects of a job which could cause delays. You'll know in plenty of time where problems could occur, and you'll also know how to deal with them. Although project management specialists find PAC MICRO to be an extremely convenient desk-top management aid, even those with little or no computer experience have no trouble using it.

Manage any job, large or small

PAC MICRO has everything you need to manage any size project, including scheduling, budgeting, "what if" simulations, easy-to-read reports, and color graphics. It complements any existing business system, there are no intimidating volumes of documentation to wade through, and it can interface with our mainframe project management systems. It's already being used by Fortune 500 companies, small businesses, government agencies, and the military. The cost is $990. A demo disk is available for $100, which is applied toward purchase.

Write or call for more information. PAC MICRO is brought to you by the company that for almost two decades has made project management its one and only business.

AGS Management Systems INC.

The world's leader in project management systems

880 First Avenue
King of Prussia, PA 19406
(215) 265-1550; Telex: 510-6603320

Philadelphia/Atlanta/Chicago/Dallas/Denver/Los Angeles/Minneapolis/Montreal/New York/San Francisco/Toronto/Washington, D.C./Amsterdam/Barcelona/Jakarta/Johannesburg/London/Milan/Munich/Paris/São Paulo/Stockholm/Sydney/Vienna/Zurich

CIRCLE 102 ON READER SERVICE CARD

tone of a specified frequency for a specified time. Nothing like PLAY is implemented.

Turbo's low-level machine hooks comprise another of its major extensions. Of all IBM PC Pascal compilers, Turbo Pascal has the best repertoire of tools for accessing PC-DOS, the IBM ROM BIOS, machine memory, I/O ports, and other hardware resources. One simple procedure, for example, allows you to make any software interrupt and pass all 8088 registers and flags to the interrupt code. Using this procedure, I was able to trigger screen prints, interface to the Microsoft Mouse, and communicate through the COM1: serial port, all within the same evening of experimentation. All machine memory is available through the elegant provision of the predeclared MEM array. To "poke" a value to a location in memory, you need only write:

```
MEM [SEGMENT : OFFSET] :=
  BYTE_VALUE;
```

You may also position "absolute" variables anywhere in memory. I have used this feature to manipulate graphics screens as though they were simple arrays of bytes. All in all, Turbo Pascal makes it possible to do virtually anything the PC can do without resorting to assembly language.

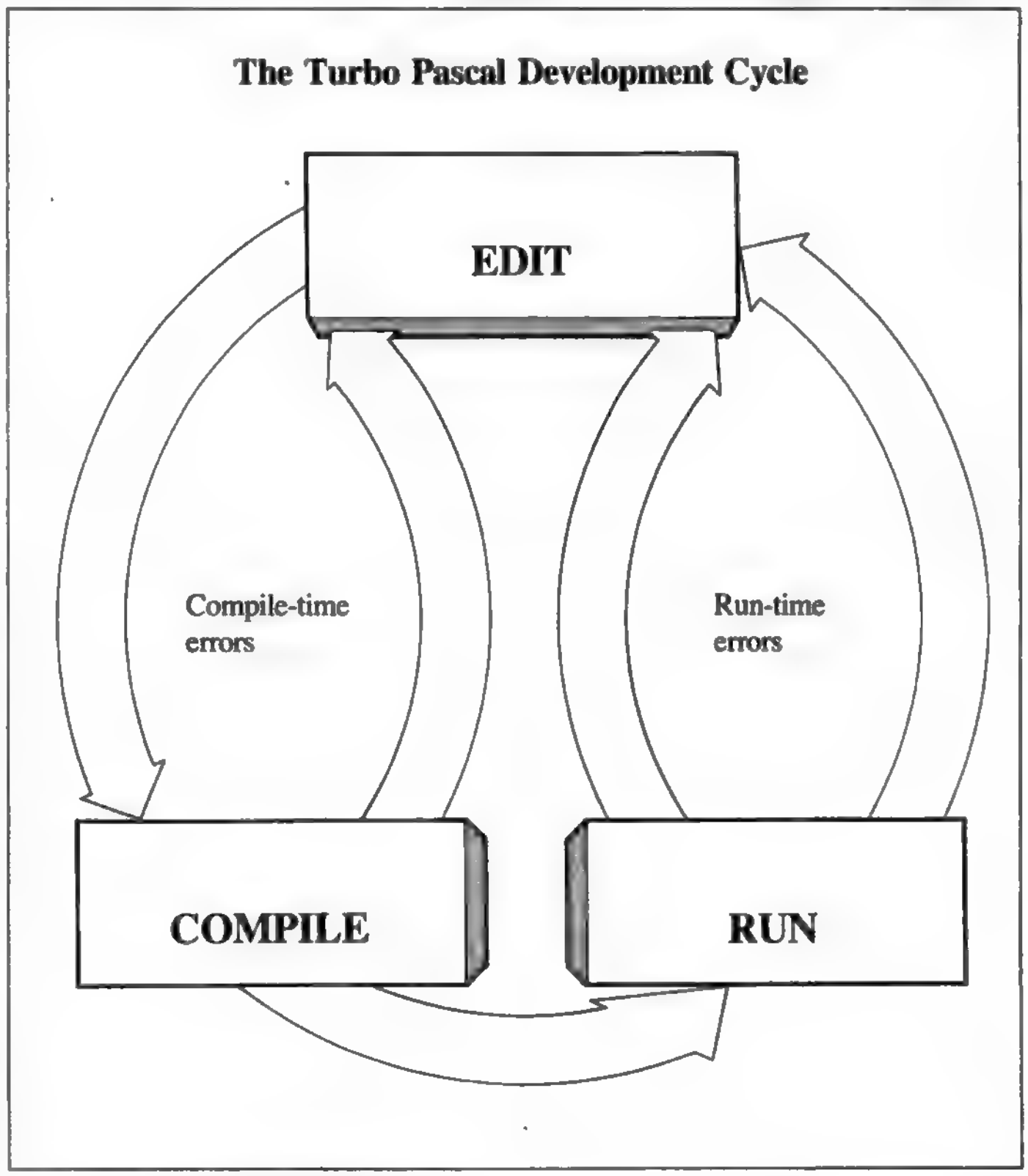
Turbo also offers 8087 support. It handles real numbers fast, much faster than Pascal/MT+, and nearly as fast as Microsoft's MS Pascal. But if you want to write programs with real-number support that really zings, use Turbo87 Pascal, a separate version of Turbo Pascal. It has all the features found in the $49.95 version, plus full 8087 support. At $89.95, it costs more, but if you need fast-floating point processing (especially on such transcendental functions as logs, square roots, trig functions, and the like), you'll find it worth the premium. A program can run from 10 to 300 times more quickly if 8087 support is included. Since you cannot buy the 8087 chip for less than about $175, getting 8087 support for less than $100 seems more than reasonable.

Overlays Made Easy

Turbo Pascal cannot create a program larger than 64K on disk. (This limitation is fundamental to PC-DOS .COM files, and Turbo Pascal produces only .COM files.) Now, 64K is a lot of program, but a large accounting system could be several times that size. Turbo Pascal allows you to cut an enormous program into pieces, to load automatically as needed. The pieces are called overlays since they overlay one another in the same region of memory. Your program is, in a sense, folded up, and a program comprising 256K of code can run handily in a 64K PC, or PC*jr*.

I have used Pascal overlays extensively for several years with Digital Research's Pascal/MT+. To put it mildly, using Turbo overlays is much easier. With Pascal/MT+ overlays, you must draw a map of your computer's memory system and decide at what absolute address overlays should run, and how far you must offset each overlay's static data into the static data segment. This system is ridiculous; computers, not programmers, should do hex arithmetic.

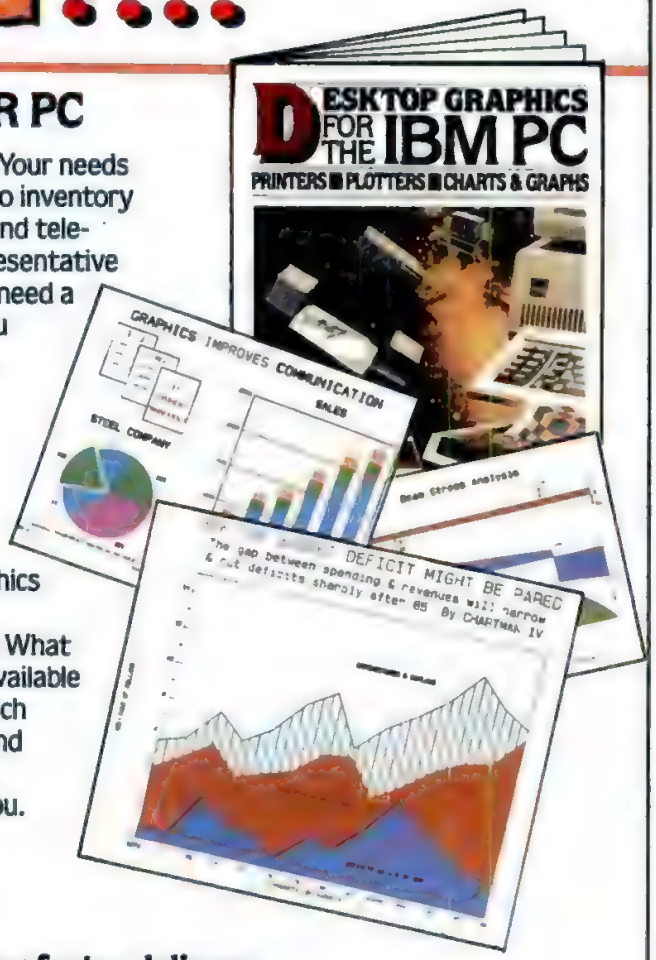
In contrast, Turbo Pascal merely requests that you tag a procedure or function definition as OVERLAY. The compiler does all the busywork—deciding where the overlay should go, how large it



The Turbo Pascal Development Cycle

USING?...BUYING?... UPGRADING?...

A GRAPHICS PACKAGE FOR YOUR PC



You have to create graphs and charts to tell your story. Your needs vary from financial statements and personnel benefits to inventory records...presentations are made on printouts, slides and tele-monitors...and for the most part, a salesman or a representative other than yourself makes the presentation. You really need a good and simple graphics package, one that will help you tell the story, without using a lot of your valuable time. You need DESKTOP GRAPHICS FOR THE IBM PC: PRINTERS, PLOTTERS, CHARTS AND GRAPHS, the fully illustrated guide to the preparation, design and production of business graphics. This is a book written with you in mind, the business or professional user with little technical or statistical knowledge, using or planning to purchase a graphics package.

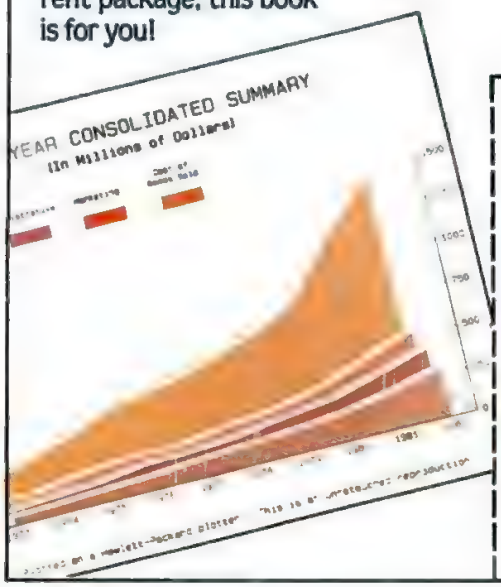
Topics include: • What hardware options you have • What software will best meet your needs • What charts are available to you and your IBM PC • What data works best with each chart • What is the difference between a mean, mode and median • How to shoot slides directly from the screen • Visitrend - Peachtree - BPS - 1, 2, 3—what's right for you.

Author Corey Sandler gives you clear and non-technical introductions to graphing theory and statistics, explaining and evaluating your hardware options (including printers, plotters and monitors), plus so much more!

If you've been contemplating buying a new graphics package or just want to get more out of your current package, this book is for you!

For faster delivery,
PHONE TOLL FREE 9 am-5 pm E.S.T.:
1-800-631-8112
(In NJ only: 201-540-0445)

Also available at your local bookstore or computer store.



CREATIVE COMPUTING PRESS

Department FG5F 39 East Hanover Avenue, Morris Plains, NJ 07950

Please send me _____ copies of DESKTOP GRAPHICS FOR THE IBM-PC: PRINTERS, PLOTTERS, CHARTS AND GRAPHS at $14.95* plus $2.00 postage and handling ($5.00 outside USA) each. Item #60-7.

Payment Enclosed $_____.* Residents of CA, NJ and NY State add applicable sales tax.

Charge My: ☐ AmEx ☐ MC ☐ Visa

Card No. _____ Exp. Date _____

Mr./Mrs./Ms. _____
print full name

Address _____

City/State/Zip _____

☐ Please send free catalog.

CIRCLE 264 ON READER SERVICE CARD

must be, and where to store its static data. You can create up to 255 different overlay files and allocate up to 16 different overlay areas ("holes" in a program into which you can load overlay files as needed) in your program.

Borland International has supplied good documentation for the overlay feature. I took only 20 minutes to get a test program with six overlays to run. The overlay manager is quite intelligent; it checks to see if an overlay is already in memory before it loads it again from disk. The Turbo overlay system allows a single program to be arbitrarily large, limited only by your disk system and your own cleverness. All in all, the system is a great feature, adding to Turbo's usefulness and value.

Overlays also come in handy when you want to configure a program to deal with different computers, or different configurations of the same computer, without recompiling the code. For example, you could write a fast, direct-to-memory screen control overlay separately for the color/graphics adapter and the monochrome display adapter. An install program, learning that the PC in use has the color board, could delete the monochrome-specific overlay file and give the color/graphics overlay file the proper name that the master program would recognize. Once the first call is made to the screen controller and it is loaded from disk, all subsequent calls will go right to memory for the screen control routines. You could also use this same trick to allow PC software to be installed on screen-incompatible computers like the Z100 and Victor 9000.

Documentation

Turbo Pascal's documentation does not come in a slipcase. The reference manual is, in fact, a trade-size paperback book of about 300 pages. This binding probably kept costs down, but the spine cracks all too easily with heavy use. Worst of all, it will not lie flat on a table open to a specific page. New users will find themselves holding the book open awkwardly with one hand while striking keys clumsily with the other. My own solution was effective, if drastic: I cut the binding away completely with a Rockwell band saw, punched holes in and joined the freed pages, and tucked them into a slipcase that once held DOS 1.0 documentation.

The manual has been typeset; the small print is clear and precise. The writing quality, however, is not up to what you'll find in applications packages like Lotus's *1-2-3* or *WordStar*, but the manual may well set a new standard for clarity among language compilers. Its writers have slanted it toward the computer-literate layperson, not the computer jock. Jargon is restrained here as compared with that in the documentation for IBM/MS Pascal. A touch of humor and frequent accommodations for human foibles make this manual very approachable. For example, when explaining the editor, it reads,

> [The Ctrl-Q-L] command lets you restore changes made to a line as long as you have not left the line . . . . For this reason, the Delete Line command (Ctrl-Y) can only be regretted, not restored. Some days you'll find yourself continually falling asleep on the Ctrl-Y key, with vast consequences. A good long break usually helps.
>
> Amen.

Turbo Pascal has never once crashed my PC in the 4 months that I have been using it intensively. This record is an enviable one.

The acid test of a Pascal reference manual is, will it teach a newcomer Pascal? My answer would have to be no. Although you could learn Pascal by writing toy programs and turning them loose to see what blows up, that's no way to develop a good programming style. I recommend that you use *Personal Pascal* by David E. Cortesi and George M. Cherry (ISBN 0-8359-5522-2, Reston Publishing, 1984) as a guide, with the Turbo manual handy to explain specific details. *Personal Pascal* does not mention Turbo specifically, but Turbo Pascal is very similar to Pascal/MT+. You can resolve the minor differences fairly easily.

Ease and Reliability

Turbo Pascal for the PC comes installed for the PC hardware; no installation operation is necessary. The menu screen spells out all commands in full, and yet you can invoke each by pressing a single key.

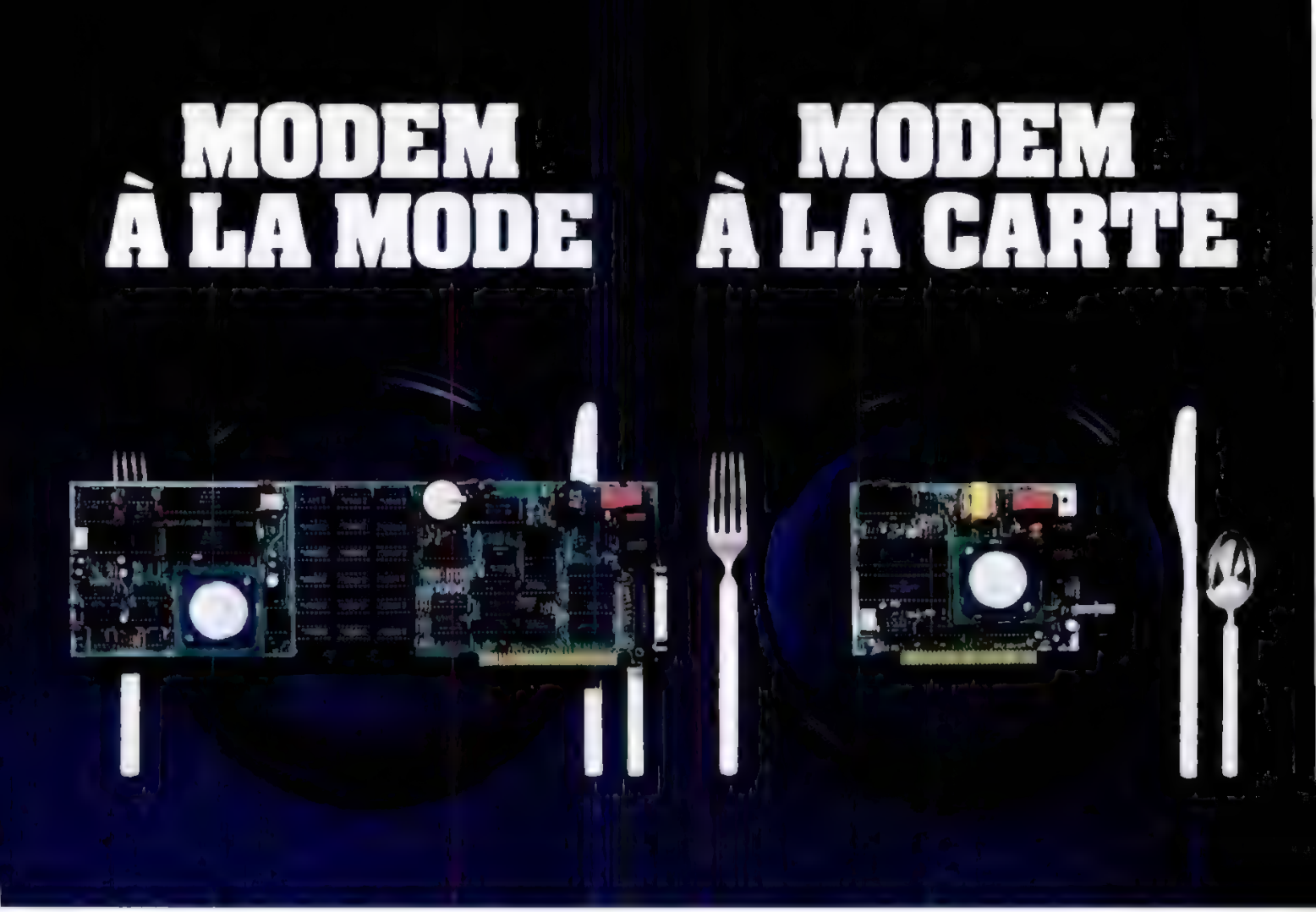
The Turbo text editor is a subset of *WordStar*, with some (irritating but not fatal) quirks. The editor does not use tab characters; if you import a text file with tab characters, they appear as highlighted *I*'s. This does not affect compilation, but it destroys readability. Turbo tabbing sends your cursor to rest under the first character of the next word in the line immediately above the current cursor line. If the line above has no text, pressing the Tab key does nothing. This quirk is very irritating, but after several months I have grown used to it.

I happen to love *WordStar*, but I know some of you detest it. Turbo Pascal's installation program allows you to redefine the keystrokes necessary to invoke a particular command. A college student who worked with me on Turbo blithely transformed the editor so that it looked like the Yale Editor in a matter of minutes. Turbo Version 1.0 had problems with keystroke redefinition, but evidently Borland has eliminated them in Version 2.0.

I found one bug in the PC implementation of Turbo Pascal; it is a rather arcane one, and the way I found to work around it

MODEM À LA MODE

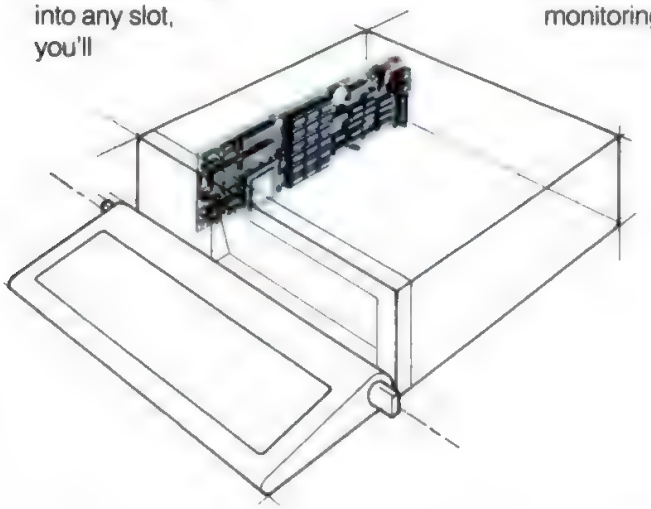
MODEM À LA CARTE



THERE'S A PC BOARD TO SUIT YOUR TASTE.

It's an appetizing choice—no matter which space-saving modem you choose for your IBM PC, XT, Portable, or any other compatible computer.

If you're looking for a modem that fits into any slot, you'll like our 5¼" mini-board. It transmits and receives data at a maximum speed of 1200 baud (120 characters per second), and features auto-dial, auto-answer, and audio phone line monitoring.



Or, select our 'à la mode' 13" slot board. You'll enjoy the same quality performance that's available on our 5¼" model, topped off with extra features that would normally take three extra slots. These include a real-time clock/calendar, a printer interface, and either 64K or 256K of additional RAM.

And with each modem, U.S. Robotics includes Telpac™ the feature-filled telecommunications software package that is everything you need for error-free, automatic data transmission.

So, whether you order à la mode or à la carte, you'll get the most out of every byte.

U.S. Robotics, Inc.
1123 W Washington
Chicago, IL 60607
Phone: (312) 733-0497
Outside Illinois: 1-800-Dial-USR

CIRCLE 498 ON READER SERVICE CARD

may seem trivial, but it works. The SEG standard function will not accept a procedure or function identifier, although the manual maintains that it will. Fortunately, the CSEG function accomplishes the same thing very well. Borland is aware of this bug, and I assume that they will fix it soon, but in any case, my code will not suffer. (I also found a small number of bugs in the generic CP/M-80 version, but they do not seem to appear in the PC version. For that reason I will not go into them here.)

Just about every other language compiler I have ever used has sent my machine spinning into the Twilight Zone from time to time. Pascal/MT+86 does it occasionally, and MRI's Modula 2 crashes when I look at it cross-eyed. But Turbo Pascal has never once crashed my PC in the 4 months I have been using it intensively. Furthermore, the program code it generates handles run-time errors neatly, with a safe return either to DOS (for standalone program operation) or into the Turbo editor to explore the problem. This record is an enviable one. I had come to believe that some obscure physical law made language compilers cranky and prone to crashes. From now on I will be less forgiving.

Complaints

I do have some complaints about Turbo Pascal, but each time I recall the price, I tell myself I'm just being a curmudgeon. But you be the judge.

My first complaint is that the manual is unwieldy. It won't lie flat. I suggest that Borland redesign it using a plastic spiral binding. A new binding would not add greatly to the cost yet would continue to prohibit it from being fed through copy machines. Also, the Version 2.0 addendum should be merged with the main text. The two separate indexes make finding a given item much harder than it should be. Plus the manual needs more examples, especially of language features unique to Turbo Pascal.

Another complaint I have is that the PC Turbo compiler always inserts a screen clear ROM BIOS call at the beginning of each program file, whether you want it to or not. This quirk makes it impossible to run PC Turbo programs on machines that do not respond to IBM's INT 10 jump table. Thus I found it impossible to develop software on my PC to run on the Victor 9000 or the Z100. Not all programs should format the screen. This feature should be optional.

I also object to the fact that Turbo does not have a relocatable object format. In other words, you cannot link third-party subroutine libraries like Metagraphics's superb *MetaWindow* graphics library to code compiled under Turbo Pascal. (Late Note: Metagraphics has released a DOS-extension style version of *MetaWindow* that is compatible with Turbo; see the sidebar "After Turbo, the Deluge" for more information.) In my opinion a relocatable format option that is compatible with MS Link would be worth whatever extra it might cost.

> Turbo Pascal has the potential to be developed into the finest Pascal compiler ever implemented on any computer of any kind.

And, as a final complaint, I maintain that the text editor should handle tabs in the expected fashion, as described above.

When compared with what Turbo can already do, my objections are perhaps slight. I only hope that Borland International pays enough attention to user needs to develop Turbo into the product it has the potential to become: The finest Pascal compiler ever implemented.

All software products have a certain feel to them—a complicated vector sum of user interface, documentation tone and quality, product emphasis, speed, and reliability. A vendor can strongly affect a product's feel as well by slanting it toward a particular audience.

Microsoft's MS Pascal, for example, is a large, complicated, and awesomely powerful Pascal compiler, perhaps the most powerful compiler I have ever used. Microsoft has deliberately slanted it for the computer expert; its documentation is 100 percent jargon, virtually inaccessible to the beginner. Pascal/MT+ shares the same feel, as if to say, "Only the initiated need apply."

IBM BASIC, on the other hand, has a very different feel, one of "Try me. If you make a mistake, it's no big deal." Turbo Pascal shares that feel, from its uncomplicated structure to its reasonably accessible user guide.

Turbo is certainly the best Pascal for first-time Pascal users. Its immediate feedback and lack of time spent watching while the machine does its work makes it a natural for schools, whose students have limited attention spans. Its price, comparable to that of an expensive college textbook, makes it possible for each student to own a copy.

VolksPascal

I like to call Turbo Pascal a VolksPascal, a compiler for folks who don't have an M.S. in computer science. It's not as powerful as MS Pascal, but it's simpler. In its simplicity it achieves an elegance that no other language compiler has ever displayed. And although Turbo Pascal is not as powerful as MS Pascal, it's not *much* less powerful. The addition of overlays to Version 2.0 makes Turbo Pascal a near-perfect applications language.

If you simply must have the greater power of MS Pascal, you know who you are. Everybody else, give Turbo a try. Your $50 will easily give you more for your money than any other $50 you have ever spent. ■

UNISON™

An uncanny approach to business software integration.

Unison™

UNISON™ from O'Hanlon breaks down the traditional barriers between a Word Processor and Spreadsheet. Most integrated Word Processing and Spreadsheet software packages are really separate applications which share data. UNISON™ is a free form window for manipulation of data and text. UNISON™ can easily include text in your spreadsheet or do calculations while you create your documents.

Multi-user

UNISON™ by itself is very impressive, but working in tandem with the SENSIBLE SOLUTION™ data base and its applications*, it is unbeatable! Think of the SENSIBLE SOLUTION™ application as the structured data "gatherer" and UNISON™ as the free form data "analyst." The important thing to remember is that the "analyst" has instant, concurrent access to the latest work of the "gatherer" due to the multi-user capability of the system. UNISON™ is the first multi-user Spreadsheet and Wordprocessor... think of the productivity possibilities.

Networking

UNISON™ also works well on LANS* (local area networks). UNISON™ is not limited to just IBM and its range of look-alikes, but will operate on a variety of different operating systems* (either 8 bit or 16 bit).

A free form window combining Spreadsheet and Word Processing power, together with SENSIBLE SOLUTION™ data base applications, all working in UNISON™. ***If you really want your business to hum, do it in* UNISON™.**

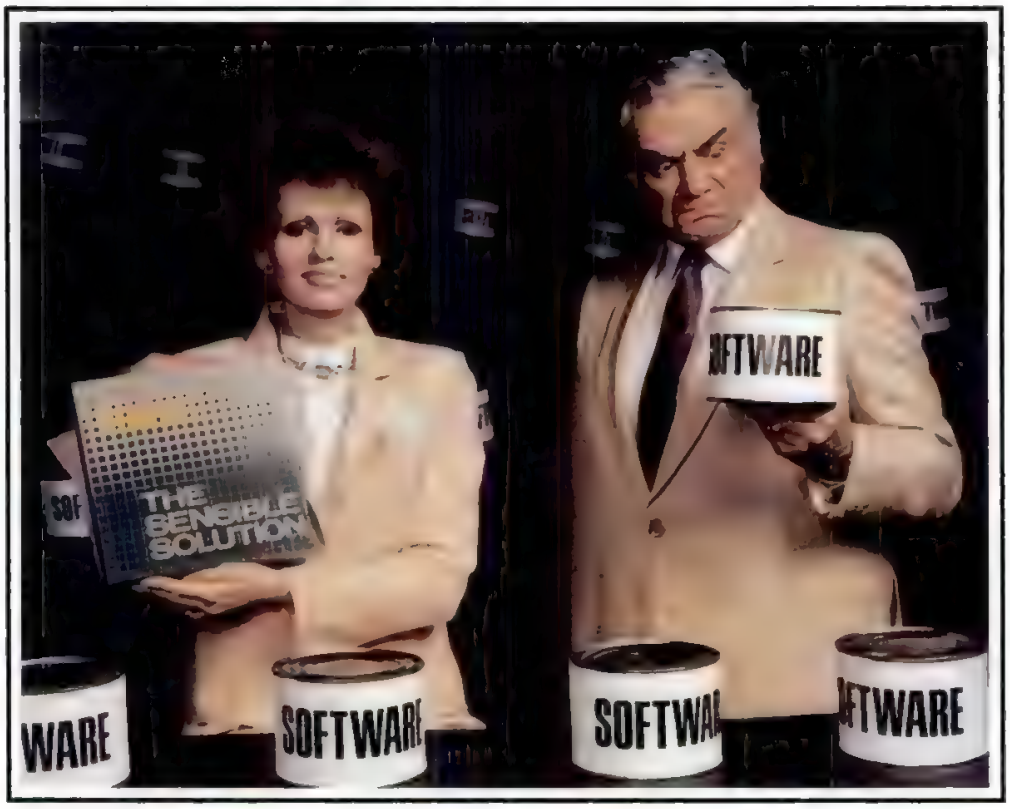
***Applications**
- General Accounting
  - General Ledger
  - G/L A/R A/P
- Wholesale Distribution
  - Sales Order Entry
  - Purchase Order Entry
  - Inventory Control
- Payroll
- Law Office Management
- Architect and Engineering Mgmt.
- Point of Sale

***Operating Systems**
- MS-DOS
- PC-DOS
- CPM/80,86
- MPM/80,86
- TURBO-DOS
- MODUS
- MMM-OST
- N Star
- UNIX (coming soon)
- ZENIX (coming soon)

***Lans**
- Netware
- P.C. Net
- HI NET

O'HANLON
COMPUTER SYSTEMS
8383 158th Ave. NE, Redmond, WA 98052
Phone (206) 885-2502 Telex 152974

CIRCLE 467 ON READER SERVICE CARD



Ernest and Tova Borgnine

The SENSIBLE SOLUTION™ programming language for most single and multi-user operating systems is $695 (single-user) and $995 (multi-user) with accounting modules at $250 each. **UNISON™** retails at $595, with a 30-day introductory rate of $495 for current SENSIBLE SOLUTION™ users. UNISON™ and The SENSIBLE SOLUTION™ Database may be purchased together at a 30-day introductory rate of $1,190. Source Code is available at $50 for G/L and Payroll, $100 for General Accounting and Wholesale Distribution. Maintenance Contract is $30 per hour with a minimum purchase of 4 hours, this includes updates at a nominal shipping and handling charge. Products are shipped best method unless otherwise specified. Freight terms C.O.D.

TRADE IN Your Unused IBM* PC Or XT* Keyboard
See Your Participating Dealer For Details

The Key Tronic KB 5151: A Superior Keyboard For The IBM* PC or XT.*

Improve your IBM* PC or XT* with a plug-compatible KB 5151 keyboard from Key Tronic. This professional series keyboard is designed for word processing, spread sheets, as well as other applications. Advantages over the regular IBM keyboard are:

- Separate numeric pad.
- Separate cursor keys.
- Function keys on top row for easier and more accurate operation.
- SHIFT & RETURN keys in familiar typewriter locations.
- Easy-to-read key legends instead of symbols.
- LED indicators on all LOCK keys.
- Convenient ENTER key.
- Solid-state capacitive switches.
- Positive tactile feedback.

Designed for reliability, each key switch is rated at 100 million cycles, which translates into eight hours of daily use for 12.8 years at 80 words per minute.

The KB 5151 — from Key Tronic, the world's largest independent manufacturer of computer keyboards.

Ask your local dealer about the IBM* compatible KB 5151 today, or call us toll-free for more information . . . **1-800-262-6006** (7 am to 3 pm Pacific Time) — Washington State (509) 928-8000.

*IBM and XT are registered trademarks of IBM Corporation.

*This layout is also available for the PCjr

key tronic
The Responsive Input Company

P.O. Box 14687 • Spokane, WA 99214 (U.S.A.)
(509) 928-8000

CIRCLE 243 ON READER SERVICE CARD

SAVE HUNDREDS OF $$$ BY UPGRADING MEMORY BOARDS YOURSELF!

IBM MEMORY EXPANSION KIT

COMPATIBLE WITH MOST PC's (e.g. COMPAQ, COLUMBIA, etc.)

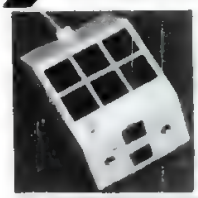
Most of the popular memory boards (e.g. Quadram™ Expansion boards) allow you to add an additional 64K, 128K, 192K, or 256K. The IBM64K Kit will populate these boards in 64K byte increments. The kit is simple to install—just insert the nine 64K RAM chips in the provided sockets and set the 2 groups of switches. Directions incl.

IBM64K (Nine 200ns 64K RAMs). $43.95

INDUSTRIES

Protect Yourself...

DATASHIELD® Surge Protector



Eliminates voltage spikes and EMI-RFI noise before it can damage your equipment or cause data loss. Six month warranty. Power dissipation (100 microseconds): 1,000,000 watts

Model 100. . . . . $69.95

DATA SHIELD® Back-Up Power Source also available. Protect your PC or XT computer from black-outs and voltage sags.

PC200 (200 Watt Rating). $299.95

XT300 (300 Watt Rating). $399.95

$10.00 Minimum Order — U.S. Funds Only
California Residents Add 6½% Sales Tax
Shipping — Add 5% plus $1.50 Insurance
Send S.A.S.E. for Monthly Sales Flyer!

Spec Sheets — 30¢ each
Send $1.00 Postage for your
FREE 1985 JAMECO CATALOG
Prices Subject to Change

MasterCard — Jameco ELECTRONICS — VISA

1355 SHOREWAY ROAD, BELMONT, CA 94002
Phone Orders Welcome (415) 592-8097 Telex: 176043

CIRCLE 168 ON READER SERVICE CARD

HAVE YOU HEARD?

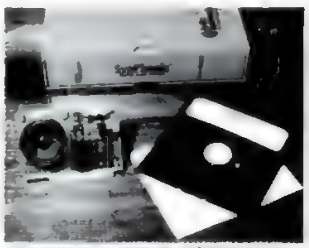
SynPhonix™

Speech Articulator for the IBM & Apple!

Hardware Synthesis at Software Prices!

SynPhonix™ features:

- SSi263 Phoneme Synthesizer
- SONIX™ ©
- External Speaker Jack
- Volume Control
- Speech/Singing/Sound Effects
- Comprehensive User's Manual
- Demo Software/Spelling Tutor
- 90 Day Warranty
- On-Board Speaker, Optional
- Suggested Retail $125.00



Unparalleled speech quality! Use in Education, Business, Entertainment, Aids for the Handicapped, Industry

With SynPhonix™ there are countless speech activities that may be performed. The SONIX™ Speech Operating System provides easy manipulation of the speech sounds and parameters. SynPhonix™ is brought to you by professionals with over a decade of experience in speech synthesis products. Ask about our entire line of speech synthesis products including text-to-speech software.

Dealer inquiries welcome!

Artic Technologies
"The Voice of Experience"

2234 Star Ct. (313) 852-8344
Auburn Heights, Michigan 48057

Apple is a Trademark of Apple Computer, Inc
IBM is a Trademark of International Business Machines

CIRCLE 108 ON READER SERVICE CARD

SAVINGS SERVICE ELECTION

Now you can get deep discounts on micro software by taking advantage of Software City's tremendous Purchasing Power.

We buy from leading software publishers in wholesale quantities, so you benefit with substantial savings on every program, every day — whether buying for home or business.

Low prices, great selection and friendly service have made us the nation's largest chain of software stores. Start putting our Purchasing Power to work for you today!

Software City®

ALABAMA: Birmingham (205) 591-8314 • Huntsville (205) 536-9456
ARIZONA: Phoenix (602) 264-1422 • Tucson (602) 721-1008
CALIFORNIA: Concord (415) 676-6662 • San Diego (coming soon)
San Francisco (415) 543-0543 **COLORADO:** Westminster (303) 430-8708
CONNECTICUT: Danbury (203) 748-5764 • W. Hartford (203) 232-2826
Orange (203) 799-2119 • Stamford (203) 359-1414
DELAWARE: Wilmington (302) 478-4880
FLORIDA: Clearwater (813) 799-4955 • Orange Park (904) 264-3102
St. Petersburg (813) 345-5132 • Sarasota (813) 923-4040
Tampa (813) 961-8081 **GEORGIA:** Atlanta (404) 257-1833
Augusta (404) 733-3707 • Columbus (404) 327-9578
IDAHO: Idaho Falls (208) 522-6099
ILLINOIS: Arlington Heights (312) 259-4260
INDIANA: Indianapolis (317) 253-8586 • Mishawaka (219) 272-9709
IOWA: Davenport (319) 386-2345 **KENTUCKY:** Louisville (502) 893-3838
LOUISIANA: Baton Rouge (504) 925-1152
MARYLAND: Bethesda (301) 468-1001
MASSACHUSETTS: Lexington (617) 861-0116
W. Springfield (413) 739-5101 **MICHIGAN:** Ann Arbor (313) 996-4500
Okemos (517) 349-2340 • Southfield (313) 559-6966
Sterling Heights (313) 978-3700 **MISSOURI:** Creve Coeur (314) 434-3311
Independence (816) 461-1260 **NEBRASKA:** Omaha (402) 333-5427
NEW JERSEY: Bergenfield (201) 387-8388 • Cherry Hill (609) 424-8155
Englishtown (201) 972-1150 • Fair Lawn (201) 791-8793
Green Brook (201) 968-7780 • Hamilton (609) 890-1066
Linwood (609) 927-3393 • Midland Park (201) 447-9794
Montvale (201) 391-0931 • Morristown (201) 267 3353
Parsippany (201) 575-4574 • Pompton Lakes (201) 831-1004
Red Bank (201) 747-6490 • Ridgefield (201) 943-9444
Summit (201) 273-7904 • Teaneck (201) 692-8298
NEVADA: Las Vegas (702) 737-8811 **NEW YORK:** Albany (518) 456-1111
Brooklyn (212) 372-6512 • Buffalo (716) 838-4950 • Fairport (716) 223-3723
Forest Hills (212) 261-1141 • Great Neck (516) 482-4929
Manhattan (212) 832-0760 • Mt Kisco (914) 666-6036
North White Plains (914) 946-1800 • Staten Island (212) 351-9217
Spring Valley (914) 352-3444 • Syracuse (315) 445-2577
Wappingers Falls (914) 297-5035
NORTH CAROLINA: Charlotte (704) 366-5218 • Fayetteville (919) 864-7293
Greensboro (919) 852-3109 • Raleigh (coming soon)
OHIO: Centerville (513) 439-1237 • Columbus (614) 888-6660
Cleveland (216) 473-8124 **OKLAHOMA:** Tulsa (918) 744-0558
PENNSYLVANIA: Bethel Park (412) 854-1777 • Exton (215) 524-1483
Fairless Hills (215) 943-4544 • Huntingdon Valley (215) 322 8166
King of Prussia (coming soon) • Pittsburgh (412) 367-0441
Whitehall (215) 434-3060 **SOUTH CAROLINA:** Spartanburg (803) 574-4713
TEXAS: Austin (512) 458-2101 • Dallas (214) 392-4499
Houston (coming soon) **VIRGINIA:** Falls Church (703) 845-9393
Richmond I (804) 740-8400 • Richmond II (804) 320-2244
Virginia Beach (804) 463-8220 **WASHINGTON:** Bellevue (206) 451-1141
CANADA: London, Ontario (coming soon)
Montreal, Quebec (look for Logiville) (514) 336-3312
ENGLAND: London 01/352-9220 **PUERTO RICO:** San Juan (809) 781-9357

Business Catalog at all stores.
RETAIL STORE FRANCHISES AVAILABLE. Offering by prospectus only
Write Software City, Dept. PC, 1415 Queen Anne Rd., Teaneck, NJ 07666

CIRCLE 213 ON READER SERVICE CARD

AST brings you the perfect 4-5-6 for your Lotus™ 1-2-3.

Introducing the MonoGraphPlus™ Graphics Card.

Lotus 1-2-3™ is probably the most-used productivity software around. The trouble is, you can't display 1-2-3 graphs on your IBM monochrome display.

That's why AST developed MonoGraphPlus™ for the IBM PC and XT. It replaces IBM's monochrome card, permitting high-resolution bit-mapped graphics and text on the monochrome display.

But our MonoGraphPlus gives you much more. While Lotus offers three useful programs (1-2-3) in one software package, MonoGraphPlus gives you three additional hardware features (4-5-6) on a single card: a printer port, a serial port, and a real-time clock-calendar. Our comprehensive documentation will even show you how to get an extra two lines of text on your screen.

So now you can produce high-resolution, flicker-free graphics without giving up the high-quality text display that makes IBM's green monitor so popular. You can also expand your PC's memory with our MP series of memory cards, turning your PC into an even more powerful workstation capable of producing very large spreadsheets with instant charts and graphs.

Leave it to AST to offer yet another state-of-the-art enhancement product for the PC. You see, we're the world's leading supplier of enhancement products for the IBM PC, offering a complete family of multifunction cards, communications emulators, and local area network products.

To get the perfect 4-5-6 for your PC see your local computer retailer, or contact AST Research Inc., 2121 Alton Ave., Irvine, CA 92714. (714) 863-1333. TWX: 753699ASTR UR

AST RESEARCH INC.

IBM is a trademark of International Business Machines Corp
Lotus and 1-2-3 are trademarks of Lotus Development
MonoGraphPlus is a trademark of AST Research, Inc.

MonoGraphPlus Graphics Card

CIRCLE 103 ON READER SERVICE CARD

Filebase is a super utility that turns a static correspondence file into a correspondence database. You won't want to use MailMerge without the file-juggling muscle of Filebase.

Filebase Rescues Stodgy MailMerge

The *MailMerge* database is the stodgiest database in computerdom. Although it's supposed to be a correspondence file, you can't do much more than individualize letters with it. Instead of pulling selected records out of a file when you need them, *MailMerge* files just sit there until an outside program comes along to do the basic filing chores.

A correspondence file shouldn't be so static. If, for instance, you wanted to turn your address file into a handy, hard-copy reference printout, you'd naturally want the proposed list to be sorted alphabetically by last name. And what if you need to cull a mailing list from a huge address file, and the people on your list must meet special criteria? You would save time if you could write a subset of the appropriate names and addresses to a temporary work file.

But to manipulate *MailMerge* files for these purposes, you first have to store the data with a high-level database manager. Then, when it's time to print letters, you have to use a built-in program function to write records in the *MailMerge* comma-delimited format. For speed and efficiency, this procedure leaves a lot to be desired. What you need is a program that makes juggling *MailMerge* files a quick-and-dirty office routine.

MailMerge Super Utility

Filebase, a database manager from EWDP Software, Inc., in Indianapolis, may be just the *MailMerge* super utility you've been waiting for. It stores data in the comma-delimited format and gives you a range of file management options to apply to existing *MailMerge* datafiles. You can choose any of the following from the main menu:

- Sort a file or sort and merge two files into one new file
- Select records from one or two files into a new file
- Sort and select records simultaneously
- Print labels, envelopes, and other listings on the screen or printer
- Add new fields to records from an existing file and output the expanded records to a new file
- Create a new file and enter data
- Key in new records to an existing file
- Move fields that are located in one file

Illustration: Rich Del Rosso

into a new file
- Update a fixed-length records file or search by key
- Convert a file to fixed-length records to use the Update option
- Change data disks in any drive.

Filebase covers all the basics. It features a data input screen with user-defined field prompts, print-time formatting of envelopes, labels, lists, and text fields, and on-screen or hard-copy column listings of fields.

You'll notice that *Filebase* lacks some features of high-end programs: sophisticated report formatting, access to more than two files at a time, and complex calculations. If you need those functions, *Filebase* isn't for you. But when manipulating *MailMerge* files, you probably won't miss them.

> Instead of pulling selected records out of a file when you need them, MailMerge files just sit there until an outside program comes along to do the basic filing chores.

Options with Muscle

Filebase flexes its muscle when pulling selected records out of a file. In addition to the field comparators you'd expect—greater than, less than, equal to, between two values—you get some nifty options: "Select or exclude by matching field con-

PC FACT FILE

Filebase
EWDP Software, Inc.
P.O. Box 40283
Indianapolis, IN 46240
(317) 872-8799
List Price: $100
Requires: 128K RAM, one double-sided disk drive.

CIRCLE 798 ON READER SERVICE CARD

IT PAYS
TO CALL PC WAREHOUSE!
404/432-5555 404/432-5555 404/432-5555

PC WAREHOUSE PC WAREHOUSE PC WAREHOUSE PC WAREHOUSE PC WAREHOUSE PC WAREHOUSE

FLOPPY DISK DRIVES
(*IBM PC compatible)
Tandon TM100-2 (DS/DD) $199.00
½ height DS/DD $169.00

64K RAM CHIP SETS: $49.00

MONITORS
Amdek 310A $175.00
Princeton Graphics System HX12 $479.00
Quadram Quadchrome $479.00
Gorilla (green) $ 89.00
Hitachi 12" (green) $ 89.00
Taxan 12" (amber or green) $139.00

PRINTERS
Okidata 82 $302.00
Okidata 83 $569.00
Okidata 84 $789.00
Okidata 92 $439.00
Okidata 93 Best Price!
Gemini 10X $285.00
Gemini 15 $389.00
Epson RX80 Call
Epson FX80 Call
Epson FX100 Call
Epson MX100 $599.00

MONITOR INTERFACE CARDS
Plantronics Color + $389.00
PC Peacock $219.00
USI Multi-Display Best Price!
Hercules Hi-Res. Graphics $349.00

MULTI-FUNCTION BOARDS
AST 6 Pak Plus (with 64K) $279.00
AST Megaplus II (with 64K) $284.00
AST Gameport $ 35.00
Tecmar Captain Best Price!
Tecmar First Mate $285.00

MODEMS
Hayes SmartModem 1200 $489.00
Hayes SmartModem 1200B $429.00
Hayes SmartModem 300 $209.00
Rixon 2400 bits per second Best Price!

Please call for current prices.
Dealer inquiries welcome.
Qualified Purchase Orders Accepted

SOFTWARE
Lotus 1-2-3 $319.00
dBase II $309.00
Wordstar $239.00
Hayes SmartCom II $ 89.00
Crosstalk $108.00
Multimate Call

PC
P.O BOX 723994
ATLANTA, GA. 30339
404/432-5555

MASTER CHARGE & VISA ACCEPTED
*IBM IS A REGISTERED TRADEMARK OF IBM CORPORATION
CIRCLE 499 ON READER SERVICE CARD

HOUSE PC WAREHOUSE PC WAREHOUSE PC WARE

Why people choose an IBM PC in the first place is why people want IBM service...in the first place.

After all, who knows your IBM Personal Computer better than IBM?

That's why we offer an IBM maintenance agreement for every member of the Personal Computer family. It's just another example of blue chip service from IBM.

An IBM maintenance agreement for your PC components comes with the choice of service plan that's best for you—at the price that's best for you.

Many customers enjoy the convenience and low cost of our carry-in service. That's where we exchange a PC display, for example, at any of our Service/Exchange Centers.

And for those customers who prefer it, we offer IBM on-site service, where a service representative comes when you call.

No matter which you choose for your PC, an IBM maintenance agreement offers you fast, effective service.

Quality. Speed. Commitment. That's why an IBM maintenance agreement means blue chip service. To find out more about the specific service offerings available for your PC, call 1 800 IBM-2468, Ext. 141 and ask for PC Maintenance.

Blue chip service from IBM

CIRCLE 162 ON READER SERVICE CARD

TOLL FREE ORDERS ONLY! 800-631-0962
(INSIDE CALIFORNIA) 800-521-6162

Customer Service HOTLINE (408) 559-6556

GUARANTEED the LOWEST!

OUR PRICE GUARANTEE – It's Simple! We'll beat any ad in this magazine – same terms – call TOLL FREE for details!

DCC DISCOUNT COMPUTER CENTERS

OUR CUSTOMER SATISFACTION GUARANTEE: If for any reason your DCC purchase fails to meet manufacturers specifications within 30 days of purchase, please return it to us for a full refund or exchange of your choice! Sorry, software excluded due to copyright laws.

EPSON all models! RX/FX and LQ1500 — PRINTER SALE!!! all models 82/83 92/93!! **OKIDATA**

IBM PC $1449 1 drive 64K with 2 drives 256K $1795 — **IBM XT** 256K, 10 mg. hard disk 1-360Kb drive only **$3695**

WORDSTAR PRO PACK • Wordstar • Correct Star • Star Index • Mail Merge only **$249**

COMPUTERS

IBM PC & XT... See special above!!!
COLUMBIA w $3000 retail software!
VP Portable – 256K ... ridiculously
1600-1 2 drives ... low!!
1600-4 Hard Disk ... please call!!!
VISUAL COMMUTER New 16 lb IBM Compatible 256K 2 drives ... $Call

MONITORS

IBM MONOCHROME ... 259
COLOR ... 589
AMDEK 300G ... 129
300A ... 145
310A ... 165
GORILLA Composite monochrome . Sale!
Green or Amber ... 85
TAXAN 12" Green ... 114
12" Amber ... 117
420 RGB ... 439
PRINCETON HX-12 ... 467
SR-12 ... 649
MAX-12 ... 184
ZENITH 122 – 12" G ... 93
12" A ... 93
124 MONO – IBM ... 169
133 RGB ... 446
135 RGB/COMP ... 475

MODEMS

HAYES 300 ... 199
1200 ... 468
1200B IBM INTERNAL ... 398
MICROMODEM II E ... 229
ANCHOR MARK XII ... 259

PRINTERS

*****DOT MATRIX*****
EPSON RX 80 100 cps ... 289
RX 80 F/T 100 cps ... 319
RX 100 100 cps 132 col ... 522
FX 80 160 cps ... best price
FX 100 160 cps 132 col ... in
LQ 1500 200 cps NEW! ... magazine
OKIDATA 82A/83/84 ... Save
92P ... All
93P ... Models
2410 ... Drastically Reduced!!
GEMINI 10-X ... 258
15-X ... 369
C-ITOH PROWRITER ... 324
*****DAISY WHEEL*****
PRINAGE I 55 cps, SER/PARR ... 1395
w/Cut Sheet Feeder ... 1695
BROTHER DAISY WHEEL
HR-15 ... 359
HR-25 ... 599
HR-35 (36 cps) ... 969
JUKI 6100 ... 419
DTC 380 Z ... 949
DIABLO 620 ... 829
36 ... 1276
630 ... 1689
TTX 1014 SER/PAR/TRACTOR ... 360
DYNAX DX-15 ... 359
SILVER REED 550P ... 580
NEC 3550 ... 1845
QUME ... 559

DRIVES

IBM 360 KB ... 219
TANDON 100-2 360KB ... 185
PANASONIC ½ HI-360 KB ... 149
TEAC ½ HI-260 KB ... 159
SHUGART ½ HI-360 KB ... 149
EVEREX 10 MG H D W/CONTRL ... 798
ATARI INDUS GT ... 349

IBM SOFTWARE

*****SPREADSHEETS*****
FRAMEWORK Monthly Special ... 399
MANAGING YOUR MONEY ... 138
SUPERCALC 3 ... 228
MULTIPLAN ... 136
IBM WORDPROCESSORS
WORDSTAR PRO PACK ... 249
PFS WRITE ... 84
MULTIMATE ... 249
WORD W/MOUSE ... 269
VOLKSWRITER DELUXE ... 159
PEACHTREE SOFTWARE all ... $Call
IBM DATA BASE
dBASE II ... 284
dBASE III ... 299
PFS FILE ... 84
CONDOR III ... 249
R-BASE 4000 ... 279
FRIDAY ... 179
IBM MISC
CROSSTALK ... 104
COPY II PC ... 29
MASTERTYPE ... 37
PROKEY 3.0 ... 79
HARVARD PROJECT MGR ... 245
SIDEWAYS ... 45
NORTON UTILITIES ... 55
PFS REPORT ... 79
DOW JONES ANALYST ... 219
SET FX + ... 47
IBM GAMES
FLIGHT SIMULATOR ... 34
PINBALL ... 39
THINKTANK ... 129
FROGGER ... 28
ULTIMA III ... 35
ZORK ... 35
GATO SUB SIMULATOR ... 35

IBM – BOARDS

HERCULES GRAPHICS ... 315
HERCULES COLOR New! ... 199
AST SIX PAK W/64K ... 249
MEGAPLUS ... 259
STB GRAPHIX PLUS ... 322
EVEREX GRAPHIC EDGE ... Low!!
H.D CONTROLLER ... 299
MAJIC CARD ... Low!!
QUADRAM QUADBOARD W/64K ... 269
QUADBOARD I ... 199
QUADLINK ... 449
IBM MONOCHROME ... 249
COLOR GRAPHICS ... 219
PLANTRONICS COLOR PLUS ... 358
MA SYSTEMS PC PEACOCK GRAPHICS ... 235
TECMAR GRAPHICS MASTER ... 475

IBM ACCESSORIES

64K RAM CHIPS 200ns ... 45
150ns ... 45
IBM KEYBOARDS ... 179
KEYTRONICS 5151 NEW! ... 199
5150 ... 189
MICRO-SOFT MOUSE ... low!!!
MOUSE SYSTEM-MOUSE ... 139
KOALA PAD ... 85
KRAFT JOYSTICKS ... 45

APPLE – BOARDS

ORANGE MICRO GRAPPLER ... 113
BUFFERED ... 168
MICROMAX GRAPHMAX ... 99
VIEWMAX 80 ... 139
VIEWMAX 80E W/64K ... 189
MICROSOFT 16 RAM CARD ... 75
SOFTCARD ... 239
SOFTCARD PREMIUM PAK ... 475

ACCESSORIES

PRINTER RIBBONS all makes ... Low!!!
64K RAM chips SALE ... 45
VERBATIM SS/DD diskettes ... 21
DS/DD diskettes ... 28
DYSAN SS/DD diskettes ... 26
DS/DD diskettes ... 34
DISK MINDER-PLEXI (75) ... 29
DISK MINDER W/KEY (100) ... 34
SURGE PROTECTOR Compugard ... 69
PTI POWER BACK-UP 200 w ... 329
300 w ... 549
FINGERPRINTS – EPSON all models ... 48
PRINTER DUST COVER all models ... 10
MONI-BASE Monitor Stands ... 22
COMPUTER PAPER all makes ... Low!!!
PRINTER STANDS Plexiglass ... 29/39
COMPILERS ... $Call

ATARI C-64

ACCESSORIES low, low ... CALL!!
C-64 CARDCO + G ... 79
ATARI MP1150 ... 94
APE FACE ... 69
PRINTER INTERFACES all ... $Call

QUADRAM 384K QUADBOARD w/64K RAM **$249**

AST $229 SIX PAK PLUS w/64K RAM **$249**

FRAMEWORK ASHTON·TATE It's Here! **$399**

EVEREX GRAPHICS EDGE MONO AND COLOR ON A MONO MONITOR.

SHUGART ½ Hi-Drives $149 IBM™ 360Kb drvs. **$219**

DCC DISCOUNT COMPUTER CENTERS

an established mail order/retail distribution network

BUYER FRIENDLY TERMS! • DELIVERY We ship immediately! Most orders delivered within 5 days! Add 3% (5% min) for UPS shipping, handling, insurance. Calif residents add 6.5% sales tax. 2nd day UPS available at extra charge • PAYMENT Visa, M.C., cashiers checks, money orders, personal checks accepted (Allow 10 business days for personal company checks to clear) WE NEVER CHARGE EXTRA FOR CREDIT CARDS! C.O.D.s welcome (20% p.p. deposit) with cash, certified check or money order • WARRANTY All items shipped are new, include FACTORY WARRANTY and are GUARANTEED TO WORK. DCC is an AUTHORIZED DEALER and SERVICE CENTER for most major brands • RETURNS Must be accompanied by RMA number (supplied by DEALER) and may be subject to a 20% restocking fee. Prices and availability subject to change without notice. All items limited to stock on hand • MAIL ORDER PRICES NOT VALID AT RETAIL OUTLETS DUE TO REGIONAL PRICING RESTRICTIONS. Minimum order $50.

FREE – VISA/MC!

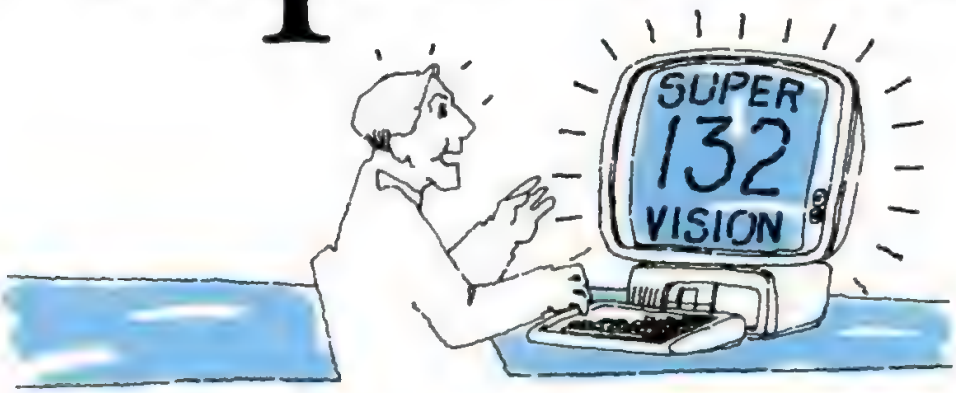
1707 S. BASCOM AVE • SAN JOSE, CA 95008 • (408) 559-6555
1243 W. EL CAMINO • SUNNYVALE, CA 94081 • (415) 965-4494
1341 FULTON AVE • SACRAMENTO, CA 95825 • (916) 971-3503

VISIT OUR DISCOUNT SHOWROOMS!

CIRCLE 157 ON READER SERVICE CARD

Normal Vision...

or SuperVision.



Expand your IBM PC/XT to 132 columns. Only $499.

"For most word processing and spreadsheet applications, SuperVision is clearly the best of the. . . products reviewed."
— Jonathan Sachs, PC World May 1984

If you have Lotus 1-2-3, dBase II, WordStar, MultiPlan, or other popular software, this is the hardware, and in some cases the **only** hardware, that can expand your vision to 132 high-resolution columns, plus DEC VT or IBM 3278-O5 **terminal emulation.**

Simply slip the SuperVision adaptor board into one of your PC/XT's expansion slots. (It's Hercules compatible, and graphics capabilities are added with an optional clip-on attachment.) Four modes are keyboard-selected: 80 × 25 (normal), 80 × 44 (full letter onscreen, no scrolling), 132 × 44 (spread sheet), or 132 × 28 (terminal emulation).

Why settle for tunnel vision when SuperVision extends your horizons wider than any adaptor board previously designed for the IBM PC/XT.

And further expand your IBM PC/XT useability with our color/monochrome graphic board at $245 and the new Telephone Interface board for direct touch-tone input to the IBM PC/XT. For details call the original manufacturer: **California Computer Systems, (408) 734-5811.** Dealer inquiries invited.

SuperVision is a trademark of CCS, Inc. IBM PC/XT are registered trademarks of International Business Machines.

CIRCLE 147 ON READER SERVICE CARD

California Computer Systems
250 Caribbean Dr., Sunnyvale, CA 94089
(408)734-5811 Telex: 171959 CCS SUVL

tent against a list of up to 300 unrelated items," and "Select or exclude up to 1,000 records by listing their sequential number in the file." *Filebase* also lets you scroll through the database, tagging records interactively—a useful feature when inviting a random list of guests to a reception, for example. In addition, *Filebase* includes the option to "Select/exclude by searching fields for *all* or *any* of up to five field substrings, with wildcard characters allowed." This substring option is handy if, for example, you need to find names followed by M.D. or Ph.D.

A nice touch: *Filebase* can sort on embedded ZIP codes, last names, and dates in the MM/DD/YY format. And *Filebase* has a valuable safety feature. It never changes an input file; program output always goes to a new file, which you may send to a blank disk in the A: drive.

> When running Filebase, you feel like you are in direct control of the computer, aptly described by programmer Alan Cooper as "direct drive."

Filebase has just one menu, the main menu. You prompt it to do all other program operations. Fortunately its command structure is a model of ease and efficiency. You can return directly to the main menu or the operating system from almost anywhere in the program, with obvious exceptions (returning from the middle of a sort, for example). When running *Filebase*, you feel like you are in direct control of the computer, aptly described by programmer Alan Cooper as "direct drive." It's comparable to the feeling that you are likely to experience when using fast machine-language and compiled programs.

Remarkably, less than a handful of the database managers currently on the market have a programming interface. Yet *File-*

Forecast Plus™

when spreadsheets aren't enough!

Forecast Plus is a comprehensive forecasting program with exploratory graphics and a data manager built in. A powerful management tool for business managers, economists, scientists, engineers, anyone involved in business planning. Forecast Plus utilizes sophisticated statistical techiques to predict future values of important variables.

data manager

includes data file creation and editing, algebraic transformations, lags and differencing.

graphics

features include time plots, 4253HT smoothing, box plots, aggregate box plots, spread vs level plots and autocorrelation functions.

forecasting

procedures include simple moving averages, single exponential smoothing, double exponential smoothing, Holt's two-parameter smoothing, Harrison's harmonic smoothing, Brown's quadratic exponential smoothing, Winter's multiplicative seasonal smoothing, robust decomposition, Census X-11 decomposition, regression trend analysis, multiple regression analysis, generalized adaptive filtering, and Box-Jenkins analysis.

easy-to-use

procedures have easy to interpret graphics. Even the novice can use these advanced techniques with the aid of interactive help features and the comprehensive manual illustrating numerous examples.

Forecast Plus

for the IBM PC and compatibles. $595.

free brochure

call now: 800-328-4907

WALONICK ASSOCIATES
5624 Girard Avenue South, Minneapolis, MN 55419
(612) 866-9022 1-800-328-4907

CIRCLE 402 ON READER SERVICE CARD

SPF/PC™

ACTUALLY, there is no comparison. SPF/PC is the best full-screen editor available for the IBM Personal Computer.

It looks and works like IBM's large system SPF editor.

- SPF/PC can use up to 786K of memory as workspace.
- Word processing commands.
- 4-way scrolling.
- Split screen support.
- On-line help facility.
- Can edit up to 240 character records.
- Monochrome or color supported.
- Instantaneous screen display.
- Block Move/Copy/Repeat/Delete/Overlay/Shift/Exclude
- Automatic line numbering supported.
- 40 user-definable Program Function Keys.
- Direct interface to DOS commands for PCDOS 2.0 users.
- Browse sub-system.
- Move/Copy sub-system copies any file format.
- Utilities include: Rename/Delete/Print/Directory list.

AND MUCH MORE . . .

UPLOAD/DOWNLOAD sub-system available to SPF/PC users for $50.00.

$149.95 SPF/PC requires 128K, PCDOS, and 1 disk drive.

THE ODD-COUPLE™

Allows the APPLE and IBM/PC to communicate with each other.

- Connect APPLE to PC, APPLE to APPLE, and PC to PC.
- Transfer any file in either direction.
- CHAT mode allows direct communications through the keyboard.
- An Equipment Profile allows description of your operating environment.
- Communicate Direct or through a Modem at speeds up to 9600 baud (bps).
- Written entirely in machine language for speed and efficiency.

REQUIREMENTS:
APPLE — 48K, 1 disk drive, Serial Interface
IBM — 64K, 1 disk drive, Serial Interface

$79.95

For orders and dealer information write or call Command Technology Corp. 1900 Mountain Blvd., Oakland, Ca. 94611, (415) 339-3530. Mastercard/Visa, Check, or P.O. accepted. Add $5.00 for shipping. Canada $10.00. Foreign $15.00.

IBM is a registered trademark of International Business Machines, Inc. APPLE is a registered trademark of Apple Computer Inc

CIRCLE 182 ON READER SERVICE CARD

Four vital software packages

From one source . . . RTCS gives your PC/MS-DOS based systems professional development capabilities with a family of operating software tools. Call RTCS today for detailed information. We'll show you how you can extend the capabilities of your PC for less money than you'd expect.

RTCS/UDI —
UNIVERSAL DEVELOPMENT INTERFACE
Run Intel Series III software on the IBM PC/XT and other MS-DOS computers.
MS-DOS is a trademark of Microsoft

PC/iRMX
Real-Time, Multiuser, Multi-tasking Operating System for IBM PC and others.
iRMX is a trademark of Intel Corporation

INTEL LANGUAGES
Pascal 86/88 Compiler
Fortran 86/88 Compiler
PLM 86/88 Compiler
C 86/88 Compiler
ASM 86/88 Macro Assembler

OTHER UTILITIES
Software Debugger
Hardware Debugger
Target System Development Link

INTEL UTILITIES
Link 86 Linker
Loc 86 Locater

Distributed in Europe by MICROTECHNOLOGIE ELECTRONICS, Paris
Japan by SYSCON CORP., Tokyo, Israel by MLRN ELECTRONIC LTD., Zahia

See us at BOOTH H7674
COMDEX/Fall '84
Nov. 14-18 LAS VEGAS HILTON HOTEL

RTCS REAL-TIME COMPUTER SCIENCE CORPORATION
SOFTWARE DEVELOPMENT TOOLS
ADVANCED OPERATING SYSTEMS

P.O. BOX 3000-886, CAMARILLO, CALIFORNIA 93011 • PHONE NO. (805) 987-9781 • TELEX 467897

CIRCLE 443 ON READER SERVICE CARD

base and *MailMerge* share the same comma-delimited format for storing data that BASIC uses. If you can program in BASIC, you are equipped to add to your options. You could write short routines to open files and perform special calculations or send customized reports to disk, screen, or printer.

YOUR PC CAN BE YOUR NEXT SMART TERMINAL.

SmarTerm software can make your personal computer a lot more intelligent than it really is.

Our terminal emulators have the features that do the job. Full keyboard emulation. Multiple setups. "Smart" softkeys. Printer support. TTY mode. Help screens. And a friendly user manual.

Built-in text and binary file transfer is powerful and simple to use, and does not require any special host software. SmarTerm also features automatic file transfer and two different "error-free" protocols, including XMODEM.

There's a SmarTerm emulator that matches your needs. **SmarTerm 100**—for emulation of DEC VT100, VT102 and VT52.

This program now features 132-column display mode support, using either horizontal scrolling or special 132-column video display boards. **SmarTerm 125**—includes all the features of SmarTerm 100, plus VT125 ReGIS graphic support. **SmarTerm 400**—for emulation of Data General Dasher D100, D200 and D400.

Over 10,000 customers have discovered just how smart their PCs can be with SmarTerm. We think you'll agree. Try it for 30 days with full refund privilege. Call today for more information.

Available through your local software dealer, or **Persoft, Inc., 2740 Ski Lane, Madison, WI 53713. Phone (608) 273-6000. TELEX 759491.**

IN A WORLD OF CHANGE, THE SMART GET SMARTERM™

SmarTerm is a trademark of Persoft, Inc. • DEC, VT100, VT52 are trademarks of Digital Equipment Corp. • Dasher is a trademark of Data General Corp. • IBM is a registered trademark of International Business Machines Corp.

persoft

CIRCLE 365 ON READER SERVICE CARD

Data Entry

To store records, you first give *Filebase* a set of field prompts—name, address, and so on—then fill in the prompted blanks that are displayed on-screen. As *Filebase* saves each record, it puts formatting commas and quotes in the right places. An old hand at *MailMerge* could create files manually with *WordStar*, the drawback being that formatting errors cause downtime during a print run. Luckily, *Filebase* has a data file debugger. You simply list the contents of a field on-screen. *Filebase* will show you where you committed a formatting error; names become street addresses, for example:

> Unlike other programs, Filebase does not use a disk-based index that must be updated for each new record.

```
1 Jack Smith
2 Linda Jones
3 Jim Berwell
4 1155 Gershwin #83
5 4300 Wilshire-Suite 1005
```

To correct your error, you'd simply make a note of the number of the last unaffected record and then use *WordStar* to find the corresponding file line. For operations that have a heavy output of letters, the debugger alone is worth *Filebase*'s price.

Filebase saves records with remarkable, RAMdisklike speed. There are two design features that account for its rapid record-saving: first, it holds new records in RAM and writes them to disk in groups; second, unlike other programs, *Filebase* does not use a disk-based index that must be updated for each new record.

Because its files don't require indexing files and its records are not fixed-length,

FAST LETTER QUALITY FOR YOUR EPSON

Now you can print **letter quality** on your Epson FX printer at **full text-mode speed,** up to 10 times faster than with programs using graphics mode. **Printer Boss**™ software gives you **two-pass dot-matrix letter quality** and lets you create a **printer buffer** of up to 32K. Or print multi-page **spreadsheets** as wide as you like, **sideways** on your paper, at high speed, in a choice of five different type sizes.

Printer Boss™ also allows full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Select** and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript for scores of different faces. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. **Emulate** the IBM-label printer for the IBM-PC while retaining full printer versatility. **Download** to FX printers five different **IBM character sets,** including graphics symbols, greek symbols, screen and APL characters. Print at full text-mode speed. Ideal for **IBM graphics** software, or **screen dumps,** or printing text from **Wordstar, Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles $59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option $99.95. With both $139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS. A TRADEMARK OF FUNK SOFTWARE PRINTER BOSS, LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT'L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY

CIRCLE 316 ON READER SERVICE CARD

To get a lot out of your printer, you need a lot of programs, right?

Wrong.
Sure, you could buy one package to change type sizes, another to create fonts, and still another to print sideways.
Or you could get one simple program to do it all!

Printworks.™ It's loaded.

SoftStyle™

SoftStyle, Inc. 7192 Kalanianaole Hwy. Suite 205
Honolulu, Hawaii 96825 Phone (800) 367-5600

$69.95 Enhances over 30 dot matrix printers, including Epson and Okidata IBM PC or compatible

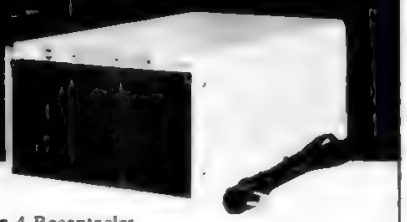
CIRCLE 514 ON READER SERVICE CARD

See us at Booth #M620
COMDEX™/Fall '84
November 14-18, 1984
MGM Grand Hotel
Las Vegas, Nevada

NEW!
Emergency Power System

Full back-up computer protection

as low as **$359**



- Completely self contained with enclosed gel cel battery.
- 200 Watt, 425 Watt and 1000 Watt models allow 10 to 30 minutes for comfortable, safe shutdown.
- Switchover time: within 10 milliseconds!
- 4 Receptacles.
- In-line spike protection.
- Sounds audible alarm during power failure.

Tested and Presently Being Sold With. . .

AMTELCO:
APPLE: Apple II Plus, Apple III, Lisa Systems
ARCHIEVES MICROS:
DIGITAL: 11-2, 11-23
HEWLETT PACKARD: 3990-A
IBM: PC, 51-10, 51-20, 51-80
AMPAX: D81
MORROW: MD-3, MD-1
SYSTEM-2:
EAGLE: IV
RADIO SHACK: TRS 80, Systems 3-16
MODECULAR: Super Micro 8
XEROX: 800 Series
NORTH STAR: HD518
KAYPRO: Model 10
QUANTEL: System 23
COMMODORE: 8096
SYSTEMS GROUP:
VICTOR: 9000

DEALERS AND DISTRIBUTORSHIPS AVAILABLE

TRIPP LITE EST 1922

Call 1-312-329-1777

500 North Orleans St., Chicago, IL 60610

CIRCLE 215 ON READER SERVICE CARD

Filebase eats up disk space much less quickly than more complex programs. A thousand records of 95 bytes each occupies an economical 95K. Program files take up about 140K.

Records can be up to 4,096 bytes long, with 40 fields of up to 255 bytes. For electronic mail applications, a built-in function can convert records to the carriage return/line feed "block format."

MailMerge datafiles can be murder to read, especially when they include many fields. But scanning is easy with *Filebase*. The desired fields appear conveniently on-screen in columns. If you sorted the file beforehand, duplicate records stand out clearly.

You can send fields to the printer in columns, too. This option encourages you to create useful lists of such items as names, phone numbers, and purchase codes. The quickness with which *Filebase* gives you lists, sorts, and selected records might tempt users of "big" programs to write subsets of their data and then use the less complex *Filebase* to manipulate them. (*R:BASE SERIES 4000, dBASE II,* and others have built-in commands to write data in the comma-delimited format.)

Since it's usually a good idea to sort *MailMerge* files by last name for reference and by ZIP code for mailings, *Filebase*'s sort function is a very convenient housekeeping utility.

Print Features

When you're ready to print, *Filebase* word-wraps text fields to the width you've specified. This feature might be useful when sending order-acknowledgment cards, for example. A .pa dot command in your print-control file would stop the printer after the address. You could then manually remove the card, turn it over, and reinsert it to print the message. If you had selected the option to stop the printer between records, *Filebase* would let you key in a "remarks" field at print time to appear at the end of the current record.

Another frustrating *MailMerge* drawback is that it prints envelopes so slowly. When you hit P, there's an annoying pause while the program accesses data from the disk. But *Filebase* comes to your aid here too: it responds to the P prompt instantaneously. And because you request filenames and formatting parameters before you print, you don't waste your energy creating and debugging *MailMerge* print-control files. *Filebase* also prints fanfold labels faster than *MailMerge*.

(continued)

7 REASONS WHY EVERY CORPORA

1. You compile sales data...track inventory...make client mailings...keep personnel records...or need timely access to facts and figures for any of a hundred other business tasks. (RELATIONAL CAPABILITIES)

2. You want the power of personal computing, but don't have the time or desire to become technical. (EVERYTHING IN PLAIN ENGLISH)

3. You need from your software what everyone wants from you—instant answers. (DATAZOOM™)

4. You have to produce all kinds of reports on a regular basis to keep everybody happy. (MULTI-FILE REPORTING)

5. You get interrupted so much even the interruptions get interrupted, so the last thing you need is software that makes you wonder where you are. (COMPLETELY MENU-DRIVEN)

Juggling Files

Have you ever tried adding a data field to an existing *MailMerge* file? You probably found that pressing your little finger on the Ctrl key again and again, looking for the ends of ragged-right data lines, can be very tiring. *Filebase*, however, gives you a break. It creates new, empty data fields and lets you fill them in. You search by random-access key field or by scrolling forward through the file. *Filebase* can also move existing data fields around within a file, saving you time and effort. Lumping infrequently used fields at the ends of records will accelerate your data entry. And you can dump an obsolete data field from a file with the same function.

Adding a coded field opens up some interesting possibilities for the select-records option. Say you've assigned five client codes: ab, cd, ef, gh, ij. You could enter them in the same data field, separated by hyphens—ab-ef-ij, for example. You could then use substring matching to select records containing any or all of up to five codes.

When updating comma-delimited files with *WordStar*, even the sharpest-eyed users find that they go cross-eyed very quickly. *Filebase*'s random-search option takes the eyestrain and headache out of updating. First you use the option that converts your files to fixed-length records; then you do updates on the easy-to-read input screen. When you've finished, you can reconvert the file to variable-length records to conserve disk space.

Filebase includes demonstration disk files and a 70-page indexed reference/tutorial. Since I've been using *WordStar* and *MailMerge* extensively for more than 2 years, I'm not an appropriate judge of *Filebase* as a program for beginners. But I can say that in applying all program functions to five databases of 350 to 850 names, I found that none of my questions required more than an occasional glance at the manual.

Filebase isn't perfect though. It won't let you give your reports elaborate formats. And you won't have access to more than two files at a time. In addition, *Filebase* won't do sophisticated number-crunching.

But if you use *MailMerge*, you're sure to find that *Filebase* has a special place in your office. While high-end programs ostentatiously show off their data-crunching prowess, *Filebase* quietly flexes its muscles. It's a speedy Mighty Mouse featuring practical tools. Once you've tried *Filebase*, you'll wonder how you ever got along without it. ■

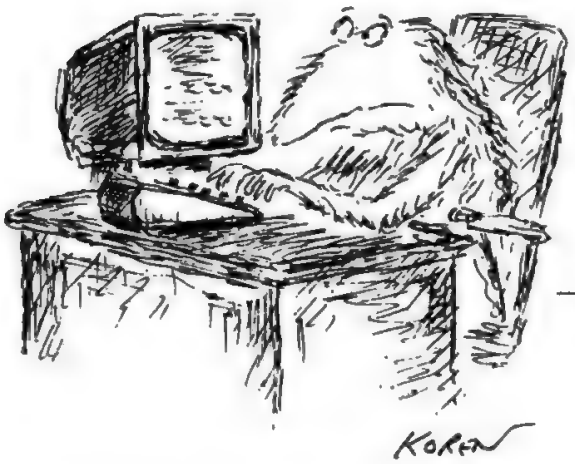
TE CREATURE NEEDS POWER-BASE.™

6. You have word-processing packages, spreadsheets, and mainframe data files, with no way to make them relate to each other. (POWERLINKS™)

7. You think you deserve some time to yourself. (THEN READ ON.)

Visit your local computer dealer today and ask for Power-base™—the #1-rated business management program that helps you get the job done simpler.

PowerBase Systems, Inc., 12 West 37th Street, New York, NY, 10018 1-800-237-4778 (In NY, 212-947-3590)



WE MADE IT POWERFUL. BUT WE KEPT IT SIMPLE.

SEE US AT COMDEX™ BOOTHS 7032, 7133.

Requires 256K for use on the IBM PC, PC/XT and compatibles. Requires 320K for use on the IBM PC/AT

Power-base, DataZOOM, and PowerLinks are registered trademarks of Powerbase Systems, Inc. IBM PC, IBM/XT, and IBM PC/AT are registered trademarks of the IBM Corporation

CIRCLE 209 ON READER SERVICE CARD

You live so

A 3M diskette can make one read/write pass on every track, every hour, every day for 200 years and still be in terrific shape.

Has 3M discovered the floppy fountain of youth?

In a way, yes.

We discovered that if you want to make a floppy that's certified 100% error-free and guaranteed for life, you have to make every last bit of it yourself.

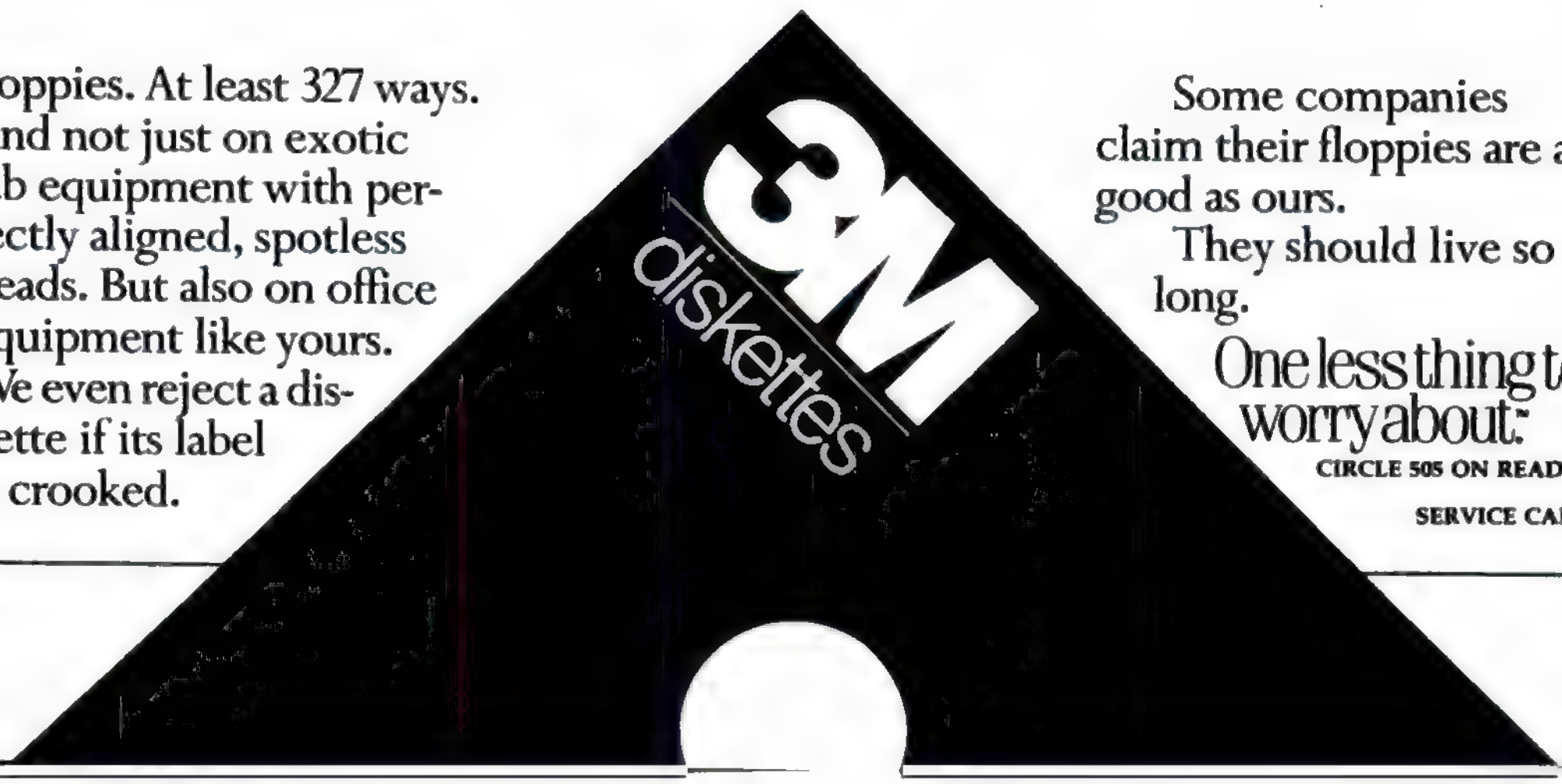
That's why we're the only company that controls every aspect of the manufacturing process.

We make our own magnetic oxides. And the binders that attach them to the dimensionally stable substrate. Which we make ourselves from liquid polyester. Which we make ourselves.

We also test our

should long.

floppies. At least 327 ways. And not just on exotic lab equipment with perfectly aligned, spotless heads. But also on office equipment like yours. We even reject a diskette if its label is crooked.



Some companies claim their floppies are as good as ours.

They should live so long.

One less thing to worry about.™

CIRCLE 505 ON READER SERVICE CARD

$2.00 WILL THAT YOUR PC IS UP TO OUR

WARNER SOFTWARE PRESENTS

THE Desk Organizer™

for the IBM PC

New Macintosh Version COMING SOON! FOR INFORMATION CALL (212) 484-3070.

Your PC was designed to do more than it does for you now.

It's fully capable of completely organizing your business day without interfering with your productivity.

At last, a hardworking software program called THE DESK ORGANIZER helps you and your PC accomplish this and more. How? By giving you one-touch command over 7 vital desk-management functions—while it runs simultaneously with virtually any other IBM software.

For $2.00, you can sample this amazing program by ordering the Demonstration Diskette with our coupon.

THE SECRET IS META

META, our exclusive feature, enables you to use THE DESK ORGANIZER alone or have it lie dormant in your computer's memory while you run Wordstar, Multiplan, Lotus 1-2-3, VisiCalc... BUT the moment you need it to file an idea, write a letter, record

The critics are raving:

"THE DESK ORGANIZER is so easy to use that its manual might be considered overkill."

"THE DESK ORGANIZER is a superb software package."

—Infoworld

"It's a gem....There's really nothing quite like this package anywhere else....THE DESK ORGANIZER is a class act."

—PC (Magazine)

PROVE IT TO YOURSELF IMMEDIATELY!

Go to one of the following dealers:

ARIZONA

Business Management Resources
1000 E Indian School Rd
Phoenix AZ 85014
(602) 274 5709

Teaching Tools
3401 N 35th Ave
Phoenix AZ 85017
(602) 272 7973

CALIFORNIA

Academy Software
2222 B West Orange Ave
Anaheim CA 92804

Valmont of California
Rte 1 Box 400
Bakersfield CA 93308

999 Software
940 Dwight Way, Ste 14
Berkeley, CA 94710
(415) 644 3611

Microtime Computers
2586-F El Camino Road
Carlsbad CA 92008

Micromerchant
898 Via Lata St "H"
Colton CA 92324

Computerland-Dublin
7190 Regional St
Dublin CA 94568
(415) 828-8090

Centaur Software
768 Jamacha
El Cajon CA

Software Centre
15617 A Ventura Blvd
Encino CA 91434
(818) 784 2234

Software Center International
15617 Ventura Blvd
Encino CA 91436
(213) 784 2238

Software Centre
Huntington Beach CA

TM Computer Store
5321 University Drive Ste D
Irvine CA 92715

Business Computer Consultant
2049 Century Park East
Los Angeles, CA 90067

Software Center
Pico
Los Angeles CA

Software Supermarket
11960 Wilshire Blvd
Los Angeles CA 90025
(213) 207 1494

Personal Support Computer
10431 Santa Monica Blvd
W Los Angeles CA 90025
(213) 474 1633

Software Galore
4079 Glencoe Ave
Marina del Rey CA 90292

Rainbow Computing
9719 Reseda Blvd
Northridge CA 91324
(818) 349-5560

Quest Computer
175 Forest Ave
Palo Alto CA 94301
(415) 327 2775

Pasadena Software Centre
548 South Lake St
Pasadena CA 91101
(818) 793-4443

Software Central
650 East Colorado Blvd
Pasadena CA 91101
(818) 793 4101

Microage Computer Store
61 Chilpancingo Parkway
Pleasant Hill CA 94523

Computerland of Redding
1175 Hilltop Dr
Redding CA 96003
(916) 223-4037

Parthenon Computers
17743 Sallcoy
Reseda CA 91335
(818) 344 3563

ACT
9161 Chesapeake Drive
San Diego CA 92123

Micro Financial
1719 Green St
San Francisco, CA 94123
(415) 928-6655

Software Center
217 Sansome St
San Francisco CA 94104

Alamo Electronics
6940 Santa Teresa Blvd
Ste 3
San Jose CA 95119

Computer Biz
4482 Pearl Avenue
San Jose CA 95136

Software Galleria
2348 Walsh Ave
Santa Clara CA 95051

Software Supermarket
15113 Ventura Blvd
Sherman Oaks CA 91403
(818) 783-3282

Parthenon Computers
17314 Crenshaw Blvd
Torrance CA 90504
(213) 516 6768

United Economic Services
23879 Madison St
Torrance CA 90505

Computer Haven
949 W Foothill Blvd
Upland CA 91786

Software Centre
916 N Mountain Avenue
Ste G
Upland CA 91786

Computer Valley
965 Fairway Drive
Walnut CA 91789
(714) 594 9748

Info Store
1666 Locust St
Walnut Creek, CA 94596
(415) 947-0277

One Point
2835 Mitchell Drive
Walnut Creek CA 94558
(415) 947 0850

Rainbow Computing
21036 Victory Blvd
Woodland Hills CA 91367
(818) 346-4276

COLORADO

The Software Store
1475 Lawrence St
Denver CO 80202
(303) 534-3707

Total Solutions, Inc.
565 S Howes St Ste 105
Ft Collins CO 80521
(303) 482 1900

CONNECTICUT

Software City
Rte 6 Plaza
58-60 Newton St
Danbury CT 06810

Queue Soft-Warehouse
636 Kings Highway
Fairfield CT 06430

Software City
Loehmann's Plaza
185 Boston Post Rd
Orange CT 06477

Software City
203 Bedford St
Stamford CT 06901

Computer Ease
Bond Industrial Park
33 Village Lane
Wallingford, CT 06492

FLORIDA

Softhouse, Inc.
P.O. Box 141136
Coral Gables, FL 33114 1136

Computer Systems Resource
3222 SW 35th Blvd
Gainesville FL 32608

GEORGIA

Software Atlanta
Atlanta GA

Computerland of Augusta
3435 Wrightsboro
Augusta GA 30909

Computerland of Atlanta
5835 G Oakbrook Parkway
Norcross, GA 30039
(404) 446-2008

IDAHO

Software Center Northwest
1897 Quincy Dr
Boise ID 83706

ILLINOIS

Personal Computer Store
320 W Ohio St
Chicago IL 60610
(312) 280-0002

Polycom Corp. of America
201 E Erie St 4th Floor
Chicago IL 60611
(312) 337-6000

Portland Metro East
7900 N Nagle
Morongrove IL 60053
(312) 966-3669

Illinois Microcomputers
630 E Ogden Avenue
Naperville IL 60540
(312) 420-8813

Northbrook Computer
4113 Dundee Rd
Northbrook IL 60062

Computerland of Oaklawn
10935 S Cicero Ave
Oaklawn IL 60453
(312) 422 8080

Compu-Net Services
2 Cross Roads of Commerce
Suite 225
Rolling Meadows IL 60008
(312) 577 9494

ComputerLand of St. Charles
2075 Prairie
St Charles, IL 60174
(312) 377 7200

INDIANA

General Micro Computer
2616 Sample St
South Bend IN 46619

MARYLAND

Entre Computer Center
4856 Bethesda Avenue
Bethesda, MD 20814
(301) 652-8775

CTL
9091 Baltimore Blvd
College Park MD 20740

MASSACHUSETTS

Corporate Software
235 Bear Hill
Waltham MA 02154
(617) 890-5350

MICHIGAN

Elias Computer Center
4215 Miller Rd
Flint, MI 48507
(313) 732 7930

Computer Mart of Grand Rapids
6441 28th Street S E
Grand Rapids MI 49508

System Directions
14230 N Lake Rd
Gregory, MI 48137

Programs Unlimited
27621 Southfield Rd
Lathrup Village MI 48076

Programs Unlimited
44473 Ann Arbor Rd
Plymouth MI 48170
(313) 455-2983

Software City
Southfield Road
Southfield MI 48020

The Software Shop
4977 Livernois Rd
Troy, MI 48098

MINNESOTA

Computer Application
1125 Harmon Place
Minneapolis, MN 55403
(612) 338-1777

Kennedy Business Systems
111 Main St
Winona, MN 55987
(507) 454-6705

MISSOURI

Software Centre
7748 Forsythe Blvd
Clayton MO 63105

Atlas Systems
1353 Pennsylvania Ave
St Louis MO 63133
(800) 325-0779

NEW JERSEY

Bamberger's Dept. Stores

Software City
Cross County Plaza
2110 Rte 70 East
Cherryhill NJ 08003
(609) 424-8155

Wolsten's Project House
99 Washington St
East Orange NJ 07017
(201) 678-0008

Lautek Corp.
1 Megan Court
Edison NJ 08820

Software To Go
2 Executive Dr
Ft Lee NJ 07024

Real Time
Glenrock NJ

Software Gallery
Jefferson Ward Plaza
Rte 70 & 73
Marlton NJ 08053
(609) 596-1234

Vista Computer Center
78 Highway 34
Pine Valley Plaza
Matawan NJ 07747

D.A. & D. Sales
Franklin Ave
Nutley NJ 07110

Entre Computer Center
312 Rte 4 East
Paramus NJ 07652

Computer Library
316 Broad St
Red Bank NJ 07701

J. Robert Mullane & Assoc.
8 Damascus Ct
Sewell NJ 08080
(609) 589-8975

Computer Communications' Group
1070 Morris Turnpike
Short Hills NJ 07078

Software City
42 Maple St
Summit NJ 07901

Entre Computer
520 5th Ave West
Westfield NJ 07090

Software House of NJ
215 Westwood Ave
Westwood, NJ 07675
(201) 664-5100

NEW MEXICO

Mountain Data Systems
8805 Northridge N E
Albuquerque NM 87111

NEW YORK

Computers for Less
297 Commack Rd
Commack NY 11725
(516) 499-2496

Computer Dealer
199 Jericho Turnpike
Floral Park, NY 11001

Macy's
Roosevelt Field
Garden City, NY

Logicsoft
Garden City, NY 11803

Measurement Science Corp.
300 Garden City Plaza
Garden City, NY 11530
(516) 741-2122

American Computer
34 West 32nd St
—10th Floor
New York NY 10001
(212) 714-0800

DSI Micro, Inc.
770 B'way—3rd Floor
New York NY 10003
(212) 475 3900

47th Street Computer
115 W 45th St
New York NY 10036

J & R Music World
23 Park Row
New York NY 10038
(212) 625-6111

Jorlath & Schwartzman
720 Fl Washington Avenue
New York, NY 10040

Macy's
34th Street
New York NY

Microtrek Enterprises, Inc.
60 E 42nd St
New York NY 10165

Software City
665 Lexington Ave
New York NY 10022

Software Solutions
90 John St
New York, NY 10038

Software Shop
300 Main St
E Rochester, NY 14445
(716) 385-6620

Computer Solutions
2716 Erie Blvd E
Syracuse, NY 13224

Management Services Group
129 Sierra Vista Lane
Valley Cottage NY 10989

Entre Computer Center
130 Westchester Ave
White Plains, NY 10601

This is a partial list of the many dealers currently stocking THE DESK ORGANIZER.
If you can't locate a dealer in your area, call (212) 484-3070.

PROVE NOT PERFORMING STANDARDS.

an appointment, check your schedule, do a quick calculation or make a phone call, you simply wake THE DESK ORGANIZER up with a keystroke, complete your task and with another keystroke, return to the other program you were working on.

IT FILES

Notes to yourself, to-do lists, appointments, agendas, correspondence, formulas, telephone lists. Touch "F" for file and enter anything you want to remember. Like a rolling card file, THE DESK ORGANIZER files free form.

IT ORGANIZES

It alphabetizes. It creates as many indexes as you need. It can file under multiple labels, cross-reference entries, scroll through the files and recall data instantly. It can retrieve a telephone number even if you can only remember a person's first name.

IT DIALS

It can take care of all your routine telephone chores, find numbers in reports or correspondence. Dial, redial, get an outside line, call an 800 number, insert a long-distance access code automatically and help you bank by phone.

IT WRITES AND PRINTS

Press "T" for type and write a letter or record the content of an important telephone call. If your need is for a standard business letter, THE DESK ORGANIZER's memory includes 25 commonly used business letters to adapt to your specifications. Just touch a key and THE DESK ORGANIZER prints the letter for you in the type style you choose.

IT CALCULATES

One keystroke and THE DESK ORGANIZER brings a visual calculator to the screen. Alongside it is an electronic paper tape which records your calculations as you go. Also accessible is a more sophisticated formula calculator which runs any formula you create with up to 26 variables, stores and edits them.

IT CHIMES TO REMIND YOU

Even while you're working on other software, THE DESK ORGANIZER can chime to remind you it's time for a meeting or a lunch date. Call up your visual appointment calendar to check or print out today's things due and things to do.

GET ONE-TOUCH CONTROL OF YOUR BUSINESS DAY

To receive the Demonstration Diskette, mail $2.00 with the coupon to Warner Software, Inc., THE DESK ORGANIZER, Dept. R, 666 Fifth Avenue, New York, NY 10103. If the coupon is missing, send your check or money order to the same address.

IBM PC is a trademark of International Business Machines Corporation
Lotus 1-2-3 is a trademark of Lotus Development Corporation
Multiplan is a trademark of Microsoft Corporation
THE DESK ORGANIZER and META are trademarks of Conceptual Instruments Company
VisiCalc is a trademark of Visicorp
Wordstar is a trademark of Micropro International Corporation

Requirements: For the IBM PC • Needs 128K memory • Two disk drives • Or IBM XT

Heathkit Electronics Center
7 Reservoir Rd
White Plains, NY 10603
(914) 761 7880

OHIO

Basic Computer Corp.
90 Showcases
Akron, OH 44313
(216) 864-7709

Ashtabula Office Equipment
5402 Main Ave
Ashtabula, OH 44004

Aaxus Micro
11306 Southland
Cincinnati, OH 45240

Aaxus Micro
680 Northland Blvd
Cincinnati, OH 45240

Flashback Computer Products
5380 North High St
Columbus, OH 43214

Micro Center
1555 West Lane Ave
Columbus, OH 43221
(614) 481-8041

Dayproom Computer, Inc.
3460 South Dixie Highway
Dayton, OH 45439
(513) 299-8555

Aaxus Micro
Forest Park, OH

Strictly Software
1670 Columbus Rd
Granville, OH 43023
(614) 587 2936

Computerland of Cleveland
701 Beta Dr Unit 30
Mayfield Village, OH 44143
(216) 473-6130

OREGON

Quest Enterprises, Inc.
207 S E Oak
Hillsboro, OR 97123

TENNESSEE

Computerland
8807 Kingston Pike
Knoxville, TN 37923

Computermart
800 South Cumberland
Morristown, TN 37814

TEXAS

Computer Basics
229 Dowlen Rd
Beaumont, TX 77706

Software, Etc.
Corpus Christi, TX

Deter Corp.
12850 Hillcrest
Suite 107
Dallas, TX 75230

Micro D Concepts
Dallas, TX 75214

Software "N" Stuff
PO Box 786086
Dallas, TX 75378

The Softsource
9100 North Central Expressway
Suite 109
Dallas, TX 75231

Your Business Software
4311 Oakdale
Dallas, TX 75219

Entre
Fort Worth, TX

PC Expansion, Inc.
1115 Oakland Blvd
Ft. Worth, TX 76103

Software Place
6369 Westheimer
Houston, TX 77057

Software Station
Sharpstown
Houston, TX

Software Station
Greenspoint Rd
Houston, TX

Mide Computer Center
Midland, TX 79705

PC Computer Products
25802 I 45
Spring, TX 77386

PC Computer Products
PO Box 7666
Woodland, TX 77380
(713) 367 7727

VERMONT

Computer Planning Center
Old Stage Rd
Grafton, VT 05146
(802) 875-3138

WASHINGTON

Eastwood Software
14330 N E 20th St
Bellevue, WA 98033

WISCONSIN

Hi Tech Learning Systems
PO Box 803
Menomonee Falls, WI 53051
(414) 274-9229

WYOMING

Alpine Computers
321 Thelma Dr
Casper, WY 82602

PC3

PROVE IT TO YOURSELF FOR ONLY $2.00!

You'll be amazed and delighted with the way THE DESK ORGANIZER works in your own IBM PC—alongside other software programs. That's why we want to send you this Demonstration Diskette for just $2.00.

☐ YES, SEND ME THE SAMPLE DISK FOR JUST $2.00*!

Name_____

Company_____

Address_____

City_____

State_____ Zip_____

*Send check or money order.
Do not send cash through the mail.

To: Warner Software, Inc.
THE DESK ORGANIZER
Dept. R 666 Fifth Avenue
New York, NY 10103

$295
suggested
retail price

A business software breakthrough from Warner Software, Inc.

CIRCLE 415 ON READER SERVICE CARD

In Software we're the *logical* choice!

LOWEST PRICE GUARANTEE

WE'LL BEAT ANY PRICE BY $10 AND THANK YOU FOR THE PRIVILEGE

FREE* OVERNIGHT DELIVERY

*YOU PAY ONLY THE UPS GROUND CHARGES. LOGICSOFT PAYS THE "OVERNIGHT" AIR CHARGES

TOLL-FREE SUPPORT

LOGICSOFT OFFERS TOLL-FREE, UNLIMITED TECHNICAL SUPPORT FOR ALL OUR CLIENTS

1-800-645-3491

516-741-0043(N.Y.S.)

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

LOGICSOFT is a Reg T M of Logicsoft, Inc

Continental U.S.

1-800-645-3491

300 Garden City Plaza,
Garden City, New York 11530

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

VISA

NO SURCHARGE FOR CREDIT CARDS

Purchase orders accepted by qualified institutions

Add 2% for shipping and handling ☐COD ☐Check ☐Money Order ☐NYS residents add sales tax

CIRCLE 282 ON READER SERVICE CARD

MasterCard

TEAR and COMPARE

Use this card to Shop the magazines

SEE REVERSE SIDE FOR ACCOUNTING SYSTEMS

WORD PROCESSING

Wordstar	$235
Wordstar Pro Pak	$365
Wordperfect	$295
Volkswriter Deluxe	$175
MULTIMATE	$275
Microsoft Word with Mouse	$289
Peachtext 5000	$195
Easywriter II/Speller Mailer	$195
Samna Word III	$425
Think Tank	$159
pfs:write	$85
Xywrite II Plus	$239

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

LOWEST PRICE GUARANTEE

WE'LL BEAT ANY PRICE BY $10 AND THANK YOU FOR THE PRIVILEGE

Tell us the advertiser and price for any IBM-PC software package advertised in a current issue of any popular computer publication and we'll beat that price by $10. This offer does not apply to those packages whose advertised price is under $100 or where LOGICSOFT's price is already the lowest!

ALL IN ORIGINAL FACTORY SEALED BOXES

INTEGRATED/GRAPHICS

Framework	$375
Open Access	$379
Jack 2	$309
Lotus Symphony	$435
LOTUS 1-2-3	$309
Dayflo	$369
Supercalc	$229
Multiplan	$135
TK!Solver	$269
BPS Graphics	$289
Chartman II & IV	$349
Chartmaster	$279

TEAR AND SAVE

WE OFFER OVER 400 OTHER TITLES

LANGUAGES/UTILITIES

Concurrent CP/M86 (Digital Research)	$225
Pascal MT+ (Digital Research)	$235
PL/1 (Digital Research)	$479
Display Manager (Digital Research)	$359
Lattice C Compiler (Lifeboat)	$299
CIS Cobol 86 (Digital Research)	$479
Pascal Compiler (Microsoft)	$245
C Compiler (Microsoft)	$325
Basic Compiler (Microsoft)	$245
Cobol Compiler (Microsoft)	$459
Business Basic (Microsoft)	$369
Fortran Compiler (Microsoft)	$245
Prokey 3.0	$89
Norton Utilities	$59
Sideways	$45

DATA BASE/FINANCIAL

R:Base 4000 (Microrim)	$309
Knowledgeman	$275
pfs:file	$85
Powerbase	CALL
dBASE III	$375
TIM IV	$269
Friday	$169
Data Base Manager II (Alpha)	$195
Revelation	CALL
Managing Your Money (Tobias)	$159
Financier II	$115
Harvard Project Manager	$285

CLIP AND SAVE OUR CARD FOR YOUR FILE

VISA

MasterCard

NO SURCHARGE FOR CREDIT CARDS

Purchase orders accepted by qualified institutions.

Add 2% for shipping and handling ☐COD ☐Check ☐Money Order

☐NYS residents add sales tax

1-800-645-3491

New York State ..... 516-741-0043 Int'l. Telex ... 230199 Swift UR LGS

Canada ..... 416-283-2354 Dom. Telex . 960127 Swift NYK LGS

LOGICSOFT

A MEMBER OF THE LOGIC GROUP

300 Garden City Plaza, Garden City, NY 11530

Continental U.S.

1-800-645-3491

New York State 516-741-0043

Canada 416 283 2354

Int'l Telex 230199 Swift UR LGS

Dom Telex 960127 Swift NYK LGS

Looking for an Accounting System?

CALL US...
WE'VE EVALUATED OVER 50 OF THEM

See our ad in *Journal of Accountancy*

TOLL FREE CONSULT
TOLL FREE SUPPORT
LOWEST PRICE GUARANTEED

INFORMATION UNLIMITED SOFTWARE (IUS)
$295 Per Module
general ledger
accounts payable
accounts receivable
inventory
order entry

payroll $359
financial series
(G/L, A/P, A/R) ... $859

CHAMPION
$399 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory control

PEACHTREE SERIES 8
$375 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory
sales invoicing
job costing

OPEN SYSTEMS
$559 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory
sales order processing
purchase order processing
job costing

REALWORLD (MBSI)
$575 Per Module
general ledger
accounts payable
accounts receivable
payroll
order entry/inventory

sales analysis $289

STATE OF THE ART
$479 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory
sales invoicing

time keeping & billing $679

BPI
$395 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory
job costing

GREAT PLAINS SOFTWARE
$479 Per Module
general ledger
accounts payable
accounts receivable
payroll
inventory

TCS
$1195
client write up

WE CARRY CONTINUOUS FORMS COMPATIBLE TO ALL THE ACCOUNTING SYSTEMS WE SELL

NEW!

QUANTITY DISCOUNTS AVAILABLE

IMPROVE YOUR OFFICE PRODUCTIVITY
and ENHANCE YOUR COMPANY IMAGE WITH
QUALITY
CONTINUOUS BUSINESS STATIONERY
From your artwork or our stock designs

FREE
BOX OF 10 FLOPPY DISKETTES
(LOGICTRAK DD5, 5 1/4" DSDD-SOFT SECTORED)
WITH INITIAL STATIONERY ORDER

LogicPerf gives you the edge stationery that separates easily leaving clean sharp edges.

CALL FOR
A **FREE**
STATIONERY KIT
NO COST OR
OBLIGATION

LOGICSOFT

We're known by the companies we keep

- ASHTON - TATE
- DIGITAL RESEARCH
- DOW JONES
- INNOVATIVE SOFTWARE
- IUS
- FOX and GELLER
- LIFETREE
- LOTUS
- MICRORIM
- MICROSOFT
- PEACHTREE
- SATELLITE SOFTWARE
- SOFTWARE ARTS
- SOFTWORD SYSTEMS
- SORCIM
- AND OVER 100 OTHER PUBLISHERS

- the Logical Choice!

LOGICSOFT
A MEMBER OF THE LOGIC GROUP

LOGICSOFT is a Reg. T.M. of Logicsoft, Inc.

NO SURCHARGE FOR CREDIT CARDS VISA

Continental U.S.
1-800-645-3491
300 Garden City Plaza, Garden City, NY 11530

New York State 516-741-0043
Canada 416-283-2354
Int'l. Telex ... 230199 Swift UR LGS
Dom. Telex . 960127 Swift NYK LGS

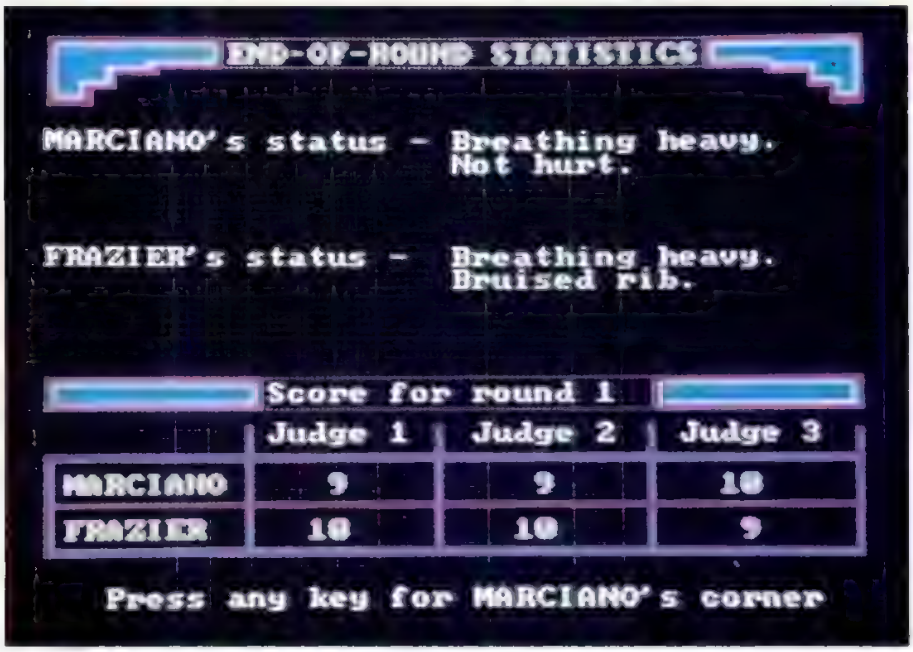
Ringside Thrills

Championship Boxing provides the fun and excitement of professional boxing from Sullivan to Holmes—without the usual wear and tear on the participants.

All through the ages, men and women have been tormented by conflicting feelings of attraction to and revulsion for professional pugilism. Protest though we may at the thought of paying to watch two humans attempt to bludgeon each other into submission, fighting has a peculiar appeal even to the most effete, lily-livered liberal. And a glance at the audience of a prize fight or a professional wrestling match reveals no shortage of women, either.

"But, it's wrong!" as Richard Nixon once said. As we move along in this modern age, 2,000 years from the days of the gladiators, there must be something that can replace the blood lust that is at the core of boxing's attraction.

Yes, folks, you guessed it: computerized boxing! No more sweaty arenas. Away with blood-spattered rings. So long, Howard Cosell (been waiting for years to say that). Bring on Sierra On-line's *Championship Boxing*.



In a *Championship Boxing* rematch, the judges put Frazier slightly ahead of Marciano after the first round.

PC FACT FILE

Championship Boxing
Sierra On-Line
Coarsegold, CA 93614
(209) 683-6858
List Price: $34.95
Requires: 128K RAM, color/graphics adapter.

CIRCLE 783 ON READER SERVICE CARD

All seriousness aside, this is truly one of those breakthrough games that comes along only ever so infrequently these days. On a single sliver of silicon resides an erudite simulation of the abilities, styles, and records of boxers from the past 100 years as well as an entertaining participatory game with staying power. *Championship Boxing* is one of the games you'll want to trot out to show to your friends and neighbors when they ask you to demonstrate exactly what it is that your computer can do.

Or, suppose you find yourself engaged in a lively discussion among gentlemen down at the Cross Keys Tavern one Friday night and that blowhard lawyer from the insurance company stands on a table and declaims to the world that Rocky Marciano was the greatest fighter of them all and that anyone who thinks oth-

LOWEST IBM PRICES
GUARANTEED
SEE PAGE 26
CIRCLE 216 ON READER SERVICE CARD

erwise is a liar and deserving of a back-alley lesson in fistic arts. Don't roll up your sleeves—just plug in your PC. (You do carry your computer with you at all times, don't you?)

A Parade of Champs

There on the *Championship Boxing* disk reside the magnetic reincarnations of 53 of boxing's greatest. Of course, there's Marciano, champ from 1952 to 1956 and winner of 43 of his 49 fights by knockout. (He retired without ever losing a professional fight.) But also represented are John L. Sullivan (who won the title in 1885), "Gentleman Jim" Corbett (who took it away from him in 1892), Jim Jeffries (1899), Jack Johnson (1908), and Jack Dempsey, the "Manassa Mauler" (1919–1926).

You can also choose among Gene Tunney, Max Schmeling, Jack Sharkey, Primo Carnera, Max Baer, Joe Louis, and other greats of the twenties and thirties. More modern boxers include Floyd Patterson, Ingemar Johansson, Sonny Liston, Muhammad Ali, "Smokin' " Joe Frazier, Ken Norton, Larry Holmes, and Gerry Cooney. And if you follow divisions other than the heavyweight, there are a few of the best lighter fighters, including Roberto Duran, "Sugar Ray" Leonard, and current favorites Ray "Boom Boom" Mancini and Hector "Macho" Camacho.

The package comes with a set of well-done instructions, a booklet about the theory of boxing, and a history of the sport including biographies of most of the boxers. The program requires 128K RAM and will run on a PC with color/graphics adapter or a PC*jr* enhanced model. The graphics are designed for a color monitor but can be viewed on a monochrome monitor attached to the graphics board output.

Historically Correct

When you start out *Championship Boxing*, you're rewarded with a nicely drawn scene of a boxing ring. There, prancing to the tune of the old Gillette razor theme, is a scantily clad young woman carrying the title card back and forth. ("If not violence, then sex," I hear someone out there say. Wrong again: think of it as historically accurate scene setting.)

(continued)

This shot of the second-round action shows the two heavyweights slugging it out.

You proceed, via an on-screen menu, to the selection of your boxers. You can select from one of the 53 fighters supplied, or you can choose to create your own pugilist—you select a name, age, height, weight, reach, endurance, style, and 15 other factors. Go ahead—put your mother-in-law up against Muhammad Ali for a laugh. The game also includes a pair of ringers: Matilda the boxing kangaroo and a wimp named Peewee. (Watch out for Matilda's feet, by the way.)

Strategy and Arcade Modes

Once the fighters are selected, you have a choice of two modes: Strategy, in which you give advice to your fighter between rounds but do not control the actual punches for him, or Arcade, in which the fight is controlled from the keyboard. You can tell your fighter to step back, move forward, jab, throw an uppercut, punch to the body or head, or cover up. In a two-player game, the boxer on the left is controlled by the function keys, the boxer on the right by the cursor keys.

Then two boxers appear on the screen. The program adjusts their skin color for historical accuracy, sizes them according to weight and height, and lets them loose to perform according to their abilities, records, and your fleet fingers on the keyboard.

If you choose to take the role of manager rather than boxer, you can limit your involvement to setting strategy between rounds and shouting instructions from the corner during the match. I found I preferred this game to the arcade version. It also allowed me to watch more closely the computer's realization of the differences in boxing styles. (For example, the young Muhammad Ali floats like a butterfly and stings like a bee; bull-like Marciano just wades in and punches.)

In This Corner

And so, sports fans, I put Marciano up against another hard puncher of more recent vintage, Joe Frazier. I managed both

Most project managers want just 3 little things from their software:

Control, control, control.

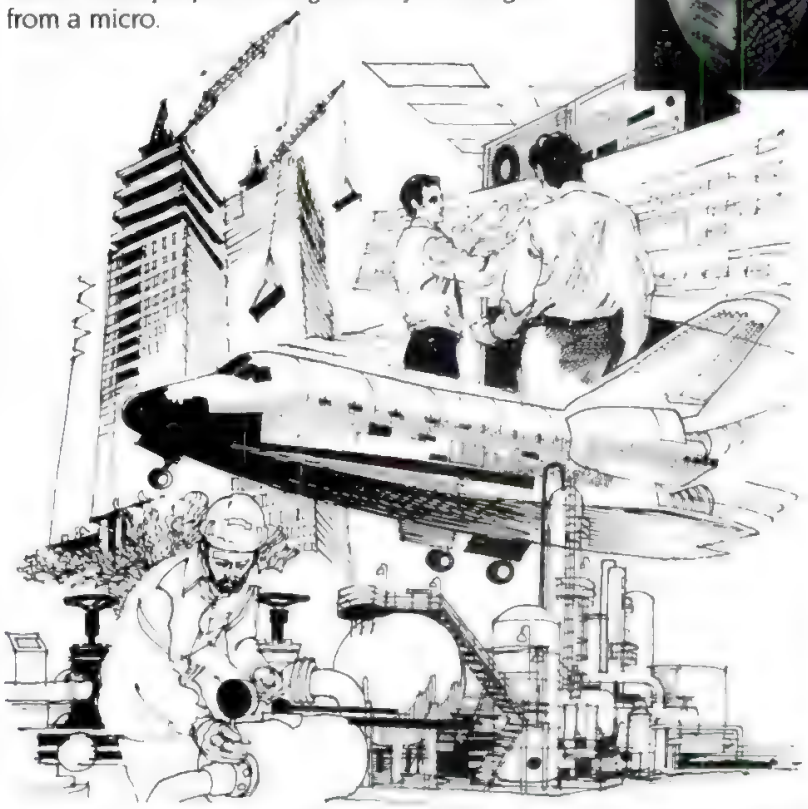
If you're a project manager, we know what you face every day.

We're project managers too. And we created our Project Planner software to provide comprehensive support for managers who run all kinds of projects . . . in engineered construction, aerospace, defense, new product development, data processing, plant maintenance and more.

PRIMAVERA Project Planner™ and Primavision™ Plotter graphics give you sophisticated scheduling capabilities for up to 10,000 activities, resource leveling, cost control, custom reporting, bar charts—the works.

PRIMAVERA PROJECT PLANNER

It's the most project management you can get from a micro.



PRIMAVERA SYSTEMS, INC. 29 Bala Avenue
Bala Cynwyd, PA 19004 • (215) 667-8600 • TELEX: 910 997 0484 PC

I'm interested: ☐ Send working demo ($75.00).
☐ Send free brochure. ☐ Call me.

SYSTEM REQUIREMENTS: IBM-PC/XT (512k)

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____ Phone _____

CIRCLE 453 ON READER SERVICE CARD

Everything
you expected
from
Symphony™
and Framework™
is now
being delivered.

By Enable.™

Think about it a moment.

If you were to sit down and design your own integrated PC software system, what would you aim for?

Wouldn't you want to be able to integrate information from all modules in one window right on the screen? And then print it?

Wouldn't you work at it until every module gave you the functionality of the very best stand alone programs?

Wouldn't you design each module to have its own appropriate file structure?

Beyond the brass ring.

Naturally, you'd also want it to run on a standard 256K PC.

It goes without saying that you'd want compatibility with the leading single-purpose programs.

And if you were to dream a bit, you'd go for concurrency because it would be great to do two or three jobs at the same time.

If you'd do all that in designing your own integrated program you'd certainly expect companies like Lotus and Ashton-Tate to do the same.

It didn't happen.

They left it all out. We put it all in.

And because we did put it all in, Enable lets you produce at levels far beyond Symphony or Framework.

Enable can integrate data from all modules in one window and then print or transmit it. For instance, you can create graphs from a spreadsheet *or* database. Then insert the graphs, the spreadsheet and DBMS data between text in a single word processing document *right on the screen*.

Functionality? Just as *you'd* do it, Enable's word processing, spreadsheet, database management, graphics and telecommunications are, without exception, equal to the leading stand alone business programs.

Further, Enable's files are not forced into clumsy or unsuitable structures. Enable isn't spreadsheet-based *or* document-based *or* DBMS based. Each module is designed for a specific application.

Symphony and Framework? Hardly.

More? There's more.

Your eyes blinked at our mention of 256K. Yet that's all you need to operate a spreadsheet with 136K of workspace. Or a word processing document whose size is limited only by available disk space. Or a DBMS file with up to 130,000,000 bytes of data.

We're sure you put a high priority on compatibility. So did we.

With Enable, you can use files from dBase II™, Lotus 1-2-3™, VisiCalc™, WordStar™, Easywriter I™ and Volkswriter™—all automatically, without conversion or rekeying. Then you can produce files in those formats for anyone who hasn't yet switched to Enable.

And you can work on your spreadsheet while you're printing a monthly report and receiving stock quotes over the wire—all at the same time.

How much good news can you handle?

It's time to admit there's one area in which Enable does not rise head and shoulders above Symphony and Framework. Price. We're the same.

$695.

And now for the next step. Borrow a loaner copy from one of our dealers and give it a workout on your own. Or, if you're a company with at least 25 PC's we'll send you a complimentary copy. No obligation. Once you're thoroughly satisfied with Enable you can trade up your Lotus 1-2-3 for $200, your dBase II for $400.

Or send $12.95 for your copy of a *complete* Enable demonstration system.

Just dial 1-800-932-0233. In New York dial 1-800-338-4646.

Will Enable live up to your expectations? Well, you designed it didn't you?

Integrated software shouldn't be a matter of choosing which compromises to live with.

enable™

integration without compromise

For the IBM®-PC and selected compatibles.

Trademarks: Enable—The Software Group, IBM—International Business Machines Corp., Volkswriter—Lifetree Software, Inc., EasyWriter I—Information Unlimited Software, Inc., WordStar—MicroPro International Corporation, dBase II, Framework—Ashton-Tate, Symphony, 1-2-3 and Lotus—Lotus Development Corporation, VisiCalc—Visicorp.

©Copyright 1984, The Software Group Northway Ten Executive Park, Ballston Lake, New York 12019

CIRCLE 191 ON READER SERVICE CARD

COMMUNICATIONS SOFTWARE THAT INTEGRATES WITH ANY PROGRAM.

SOFTERM IS ALSO AVAILABLE IN VERSIONS FOR APPLE II® AND TANDY 2000 PERSONAL COMPUTERS.

TERMINAL EMULATIONS

TTY Compatible	HP 2622A
ADDS Regent 20	Honeywell VIP7205
ADDS Regent 25	Honeywell VIP7801
ADDS Regent 40	Honeywell VIP7803
ADDS Regent 60	IBM 3101 Model 10
ADDS Viewpoint	IBM 3101 Model 20
Data General D200	Lear Siegler ADM-3A
Datapoint 3601	Lear Siegler ADM-5
DEC VT52	TeleVideo 910
DEC VT102	TeleVideo 925
Hazeltine 1400/1410	TeleVideo 950
Hazeltine 1500	User Defined
Hazeltine 1520	

Here's the first software that lets you integrate communications with all your favorite programs. Now you can add concurrent communications to programs like Lotus 1-2-3,™ dBase III,™ WordStar,® or any other IBM PC compatible software. Softerm PC™ can function two ways—as a stand-alone program or as an extension to your PC-DOS operating system to let you access Softerm's capabilities while using other programs.

Simple to use.

Softerm PC lets you interrupt any program simply by pressing one key. You can then use disk utilities, print a file, dial a host computer, use terminal mode, or initiate a file transfer. Then you can continue working in the original program while the other tasks are performed concurrently. You can even receive electronic mail while you work.

Hooks your PC to any mainframe.

Softerm PC lets you access information services, bulletin boards, electronic mail systems, and even your company's computer. It has all the features you need, including keyboard macros, built-in phone book for automatic dialing, and simultaneous capture to print or disk. Softerm's extensive file transfer capabilities include automatic execution using command files, support for popular protocols like XMODEM, and our own Softrans™ protocol which includes an adaptable source program for your host computer.

Do it all together. In real time.

Softerm PC supports concurrent operation of up to 4 communications ports and 3 printer ports through background processing queues. Now you can operate your system to its full potential by simultaneously using your available ports for printing or communications functions. Real-time scheduling eliminates unnecessary pauses and gives maximum throughput for smooth, efficient operation.

Complete emulation of 24 terminals.

Softerm PC is not limited to basic TTY terminal emulation. It includes *exact* emulations of 24 popular terminals and provides all keyboard and display functions. Also, both conversational and block modes are supported. If Softerm PC is not completely compatible with your application, return it for a full refund.

The best communications software on the market.

Right now you can buy the best communications software on the market for only $295. And that's a real bargain when you consider all the things Softerm PC will do. Plus, you get an unconditional 30-day money-back guarantee. So ask your dealer for a demonstration today.

SOFTRONICS

3639 NEW GETWELL ROAD, SUITE 10
MEMPHIS, TENNESSEE 38118, (901) 683-6850

CIRCLE 522 ON READER SERVICE CARD

fighters. Here was the "Tale of the Tape" the computer provided before the start of the match:

FRAZIER		MARCIANO	
Age	29	Age	32
Weight	205	Weight	184
Reach	74	Reach	68
Height	72	Height	71
Fights	29	Fights	49
Losses	0	Losses	0

The computer told me that it figured Frazier to be a 5 to 4 favorite in the 12-round fight.

I instructed both fighters to open the match by coming out slugging, and that's exactly the way the first round went. Marciano went right at Frazier, and they stood in the center of the ring exchanging punches. And then, midway through the round, Frazier dropped his jab and Marciano let loose an uppercut that knocked Smokin' Joe to the canvas where he sat out eight counts. But Frazier got up angry and 20 seconds later decked Marciano. The computer judges scored the round even.

The second and third rounds, during which both fighters were instructed to work on their opponent's body, went to Frazier as he repeatedly snapped Marciano's head back. Frazier was ahead on points as they entered the fourth round, but both fighters were clearly exhausted and just shuffled around the ring.

Managing Frazier at the start of the fifth round, I sensed the opportunity to end it all, and I instructed Joe to go for the knockout. Managing Marciano, I sensed that Frazier might be going for the knockout, and so I instructed Rocky to fight defensively—cover up and rest.

It was, alas, too late for the Rock. Forty-five seconds into the fifth round, Frazier lifted Marciano off the canvas with an uppercut, and Marciano was out for the count. In the background behind the on-screen ring, press photographers stood up to flash their cameras at the moment of victory, and someone tossed a hat in the air.

Championship Boxing, programmed by Dave Murry with graphics by brother Barry, is a knockout.

On *PC Magazine*'s scorecard, with a low of 0 and a high of 6, *Championship Boxing* is a heavyweight:

FUN:	5.0
CHALLENGE:	4.0
COLOR/GRAPHICS:	5.5
TOTAL:	14.5

■

EVENT: COMPETITION OF HI-RES COLOR DISPLAY FOR IBM PC

WHO IS THE WINNER?

You are the Judges!!

	Quimax PX-IV
Exceeds 700 dots resolution	★
Ergonomical tilt/swivel	★
Green text mode	★
One year warranty*	★
.31mm pitch CRT	★
2000 characters	★
16 colors (by intensity)	★
FCC class B	★
Direct Plug-in to IBM PC/XT	★
Price $	699

• MONITOR NEWS •

PX-IV TAKES THE GOLD!

By Hyres Vesion

The crowd is ecstatic as Quimax congratulates their Hi-Res champion PX-IV. One observer at the Olympiad Mr. Misty Focus stated, "That PX-IV clearly demonstrated to the competition what a real winner is made of, superior pixel resolution like I've never seen before." Another observer Mr. Hunch Neckacker states "PX-IV displayed tremendous tilt and swivel action that looks fantastic from any position." Finally, Mr. Tex Writer shouts, "PX-IV showed his switching versatility between color and green text display, he really knows how to turn it off and turn it on."

— COME TO SEE US —

• San Francisco PC Faire Booth #12
• COMDEX/Fall Las Vegas Booth #M1346

Quimax SYSTEMS, INC.
568 WEDDELL DR. SUITE 4
SUNNYVALE, CA 94089
408-734-8283 (Sales Manager)
408-734-8476 (Customer Service Manager)

IBM is a trademark of International Business Machines, Inc. PGS is a trademark of Princeton Graphic systems, Inc.
* See our warranty policy for details.
CIRCLE 201 ON READER SERVICE CARD
Ask your local dealer for a demo.

International Connections

With the industry's most popular data communications program, the world is at your command.

An import/export office in New Jersey can instantly check the London market for current dollar exchange rates ... send Hong Kong an updated production schedule ... print-out the week's sales results from the Dallas branch.

There's virtually no limit to how far you can reach with your microcomputer, ordinary telephone lines, and CROSSTALK.

Even if your own business and personal needs are closer to home, you'll appreciate CROSSTALK's compatibility with a wide user base ... smart terminal characteristics ... total modem control ... and the ability to capture data at a high speed for later off-line editing. CROSSTALK has extras you may not find in other programs. Data capture to memory buffer (and on-line display). Protocol error-checking file transfer. Modem/telephone hangup, and display of elapsed time of call. Command file power and flexibility. Remote takeover and operation. And much more.

There is a CROSSTALK version for almost every CP/M, CP/M-86, or IBM DOS based microcomputer system. See your dealer, or write for a brochure.

CROSSTALK

MICROSTUF®

1000 Holcomb Woods Parkway / Roswell, Georgia 30076

CROSSTALK is a trademark of Microstuf, Inc. CP/M and CP/M-86 are trademarks of Digital Research, Inc. IBM is a trademark of International Business Machines, Inc.

CIRCLE 326 ON READER SERVICE CARD

Kids and Computers: All in the Family

These four books take different approaches to teaching children about computers. Some expect parents to do all the work, while others leave the learning to the kids.

Microcomputers Can Be Kidstuff tries to gently introduce computers to young people. While the title certainly rings true, the book doesn't do much for the cause. The only "kidstuff" part of *Microcomputers Can Be Kidstuff* is some of the sentence structure, which strongly parallels the "See Jane run" genre of first-grade primers. Though the book contains a lot of valuable information, it is a work in search of an audience.

Where's Logo?

Microcomputers Can Be Kidstuff concentrates on programming techniques and languages, a lofty goal indeed. Author Anna Mae Burke presents a well-organized chapter on the fundamentals of problem solving that ends with respectable discussions of some difficult concepts like arrays, subroutines, and loops. Burke then proceeds to tackle BASIC and Pilot. These two languages are certainly important, but what's a kid's book without a mention of Logo? Pilot is an interactive query language designed to write computer-assisted instruction (CAI) programs, but the examples the author uses are indicative of the worst aspects of CAI. The BASIC examples she chooses to captivate young novices include programs that calculate compounded interest and quadratic equations. With programs like these I'd stick to *Breakout* and leave the programming to adults!

PC FACT FILE

Microcomputers Can Be Kidstuff
Anna Mae Walsh Burke
Hayden Book Company, Inc.
10 Mulholland Dr.
Hasbrouck Heights, NJ 07604
(201) 393-6000
Copyright: 1983
Cover Price: $8.95
ISBN: 0-8104-5202-2

CIRCLE 794 ON READER SERVICE CARD

Heavy on BASIC

Although *Growing Up with Computers* is ostensibly written to let you help your children learn to manipulate the computer, it is you who will be the computer whiz if you work your way through the authors' varied selections of BASIC programs. The programs are written in generic BASIC, so they tend to focus on simple, drill-type exercises. The sample programs include ones that measure your reading speed, teach vowels and consonants, synonyms and antonyms, math and reading skills, and some short but sweet party and action games.

The first third of this book tells the reader a bit about computers, how to buy them, and how the first day with the new toy should be, and it offers some guidelines for future software purchases. The remainder of the book is a BASIC tutorial with over 40 sample programs—you type in the programs, and your child uses them.

The book typifies the BASIC computer education dilemma. The programs the authors supply are terrific to teach *you* about programming, but they leave you and your children with a pretty dim view of the computer's potential to do anything useful or innovative. Because the authors want to keep the programs universal for all the different flavors of BASIC, they don't make much use of the features—like the PC's terrific graphics

and sound—that endear the computer to children. While the authors are quick to mention the shortcomings of the infamous computer-aided instruction approach to learning, the sample programs are typical of CAI.

Despite its shortcomings, I like this book. My kids actually enjoy the CAI drills. (Kids love hitting buttons and being told they're right.) I actually learned about programming as I transcribed the programs in the book. (I've even enhanced some of them with my own sound, graphics, and twists on the theme.) The programs are all very short—a real plus for busy parents.

Off the Mark

I've been using Chilton's automotive book series for years. After reading *The First Family Computer Book*, I'm inclined to believe Chilton should stick to engines and stay away from family computers. Any book that includes *ABEND* (a mainframe term), *asynchronous* (a communications term), and *bagbiter* (plain old slang) as glossary terms is not intended for the family. The book presents a good deal of useful information, but it is typical of the traditional computer literacy book. The information is well presented and illustrated, but, despite its title, it never gets to the heart of what a family should do with a

Growing Up with Computers: A Parents' Survival Guide
Fredrick and Victoria Williams
William Morrow & Company, Inc.
105 Madison Ave.
New York, NY 10016
(212) 889-3050
Copyright: 1983
Cover Price: $7.95
ISBN: 0-688-02794-6

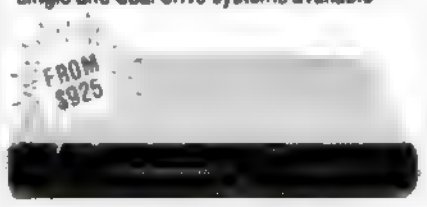
CIRCLE 795 ON READER SERVICE CARD

The First Family Computer Book
Ed and Stevie Baldwin and
K. Bruce Fingerle
Chilton Book Company
Chilton Way
Radnor, PA 19089
(215) 964-4000
Copyright: 1984
Cover Price: $12.95
ISBN: 0-8019-7498-4

CIRCLE 796 ON READER SERVICE CARD

THE INNOVATIVE SERIES
8" Flexible Disk Subsystems

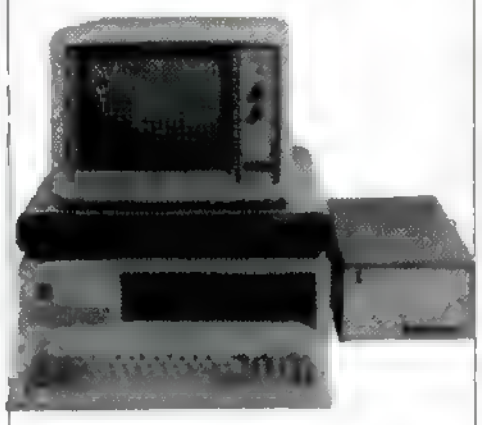
Turnkey external 8" flexible disk drive subsystem for the IBM PC and other small computers. Attractive, thinline enclosure, power supply, controller, cable & utility software including **IBM 3740 Format**. single and dual drive systems available



SPECIALIZING IN DISK AND MEMORY EXPANSION FOR YOUR PC

10 TO 120 MB
External Winchester Expansion
Plug-in-and-run External Winchester Subsystems for IBM PC. The following modules include enclosure, power supply, controller, cable, host adapter and utility software to provide the PC with the power of an IBM XT and beyond

5¼" FLOPPY DRIVES AND SUBSYSTEMS — Flexible disk drive expansion that upgrades floppy storage capacity with IBM equivalent drives or half height drives providing twice the capacity in the same space utilizing direct drive mechanisms and advanced technology for higher accuracy and reliability. Add-in drives and subsystems come complete with installaiton instructions . . .



5¼" WINCHESTER DRIVES AND SUBSYSTEMS — Winchester expansion that upgrades your IBM PC to the level of a PC XT and beyond. Available as add-in or external (shown above) subsystems providing hardware and software compatibility with the IBM PC XT but with greater flexibility ready to plug in and operate in a variety of modular configurations to suit your present and future needs . . . . .

64K RAM CHIPS
Set of 9 Chips 200 NS
Call for lowest advertised price.

SOFTWARE UTILITIES
TALL TREE
J. Format-2, Windrive, Jetdrive, & J-Spool . . . . . $40 Each

5¼" Half Height Low Power Winchester Disk Drives

INTEK offers the major lines of Tandon CDC Teac WST (Siemens), Hi-Tech Peripherals, and Vertex disk drives

TERMS: Add 2% shipping & handling on COD VISA MC *FREE* shipping & handling on prepayment Prices subject to change without notice Combination and quantity discounts are applicable No refunds Approval required on credits 20% restocking charge for returned items

INTEK
2929 Newport Blvd. Ste 5
Newport Beach, CA 92661
(714) 675-2441

WARRANTY: 90 days to 1 year repair/replace depending on manufacturer
SERVICE: All returns require an MRA (Material Return Authorization) number for in and out of warranty repair

CIRCLE 224 ON READER SERVICE CARD

CIRCLE 360 ON READER SERVICE CARD

PC LINK

INDEPENDENT STORE IN NYC DEDICATED TO IBM PC SOFTWARE AND PERIPHERALS ONLY

BY APPOINTMENT WE DEMONSTRATE MOST OF THE PRODUCTS WE SELL.

STORE HOURS: 9:00 A.M.–5:30 P.M. E.S.T. MON.–FRI.
Saturdays 10 A.M.–4 P.M.
Terms, conditions and prices differ in our store.

PC LINK, CORP. 29 WEST 38TH ST. 2ND FL., NEW YORK, NY 10018

SPECIALS OF THE MONTH

ORCHID TECHNOLOGY
Blossom Clock/Serial/Parallel/ØK.... $185.00

PAL SOFTWARES ARTPAK
- Design & Draw Floor Plans, Buildings, Animals, etc.
- Create Animated Cartoons with Music • Illuminate Graphs
- Supports Epson with Graftrax $59.00

OKIDATA
93P ..... CALL

BUSINESS SOFTWARE

ALPHA SOFTWARE
- DATA BASE MANAGER II $205.00
- TYPE FACES 89.00

ASHTON–TATE
- dBASE III ..... CALL
- FRAME WORK ..... CALL

CONTINENTAL
- HOME ACCOUNTANT PLUS 89.00
- TAX ADVANTAGE 45.00
- PROPERTY MANAGEMENT 319.00

ENERTRONICS
- ENERGRAPHICS ..... CALL

FOX & GELLER
- D. GRAPH QUICKCODE DIUTIL ..... CALL
- OZ ..... CALL

HARVARD SOFTWARE
- HARVARD PROJECT MANAGER ..... CALL

HAYES
- SMARTCOM II 95.00

I U S
- ACCOUNTING AR/AP GL ea. ..... CALL
- INVENTORY CONTROL ..... CALL
- ORDER ENTRY ..... CALL
- PAYROLL ..... CALL

LOTUS DEVELOPMENT CORP.
- LOTUS 1-2-3. (No Mail Or Phone Orders) CALL
- SYMPHONY (No Mail Or Phone Orders) CALL

MICRO DATA BASE
- KNOWLEDGE MAN ..... CALL

MICRO PRO
- INFOSTAR 269.00
- WORDSTAR PROFESSIONAL 290.00

MICRORIM
- R BASE 4000 ..... 309.00
- EXTENDED REPORT WRITER 99.00
- CLOUT (RE8.256K) 129.00
- PROGRAM INTERFACE 295.00

MICROSOFT
- MULTIPLAN 139.00
- WORD ..... CALL
- COMPILERS ..... CALL

MICROSTUFF
- CROSSTALK 105.00
- TRANSPORTER ..... CALL

MONOGRAM
- PROFESSIONAL BASIC ..... CALL

NORTH AMERICAN BUSINESS
- MEMORY SHIFT 69.00

NORTON COMPUTER
- NORTON UTILITIES 55.00

PC SOFTWARE
- CREATABASE 65.00

PALSOFTWARE
- ARTPAK ..... SEE SPECIAL

PEARL SOFT
- PERSONAL PEARL ..... CALL

ROSE SOFT
- PROKEY 3.0 ..... 89.00

STSC
- APL*PLUS ..... CALL

SATELLITE SOFTWARE
- WORD PERFECT 269.00

SAWHNEY SOFTWARE
- TAX MODE ..... CALL
- PLAN MODE ..... CALL

SOFTWARE ARTS
- TK SOLVER 249.00
- FINANCIAL MANAGEMENT 79.00
- MECHANICAL ENGINEERING 79.00

SOFTWARE PUBLISHERS
- PFS SERIES ..... CALL

SOFTWARE SYSTEMS INC.
- MULTIMATE 279.00

WARNER SOFTWARE
- THE DESK ORGANIZER ..... CALL

DISK DRIVES

- IOMEGA BERNOULLI BOX ..... CALL
- QUME T142 ..... CALL
- SYSGEN ..... CALL
- TANDON TM 100-2 ..... 200.00

MULTIFUNCTION BOARDS

- 64 RAM CHIPS 55.00
- AST CARDS ..... CALL
- QUADBOARD CARD ..... CALL
- AMDEK MAI CARD ..... CALL
- PC MOUSE ..... CALL
- FTG LIGHTPEN 149.00
- ORCHID BLOSSOM BOARD ..... SEE SPECIAL
- PLANTRONICS COLOR PLUS CARD ..... CALL
- HERCULES ..... CALL
- HELIX BUBBLE MEMORY ..... CALL

ENTERTAINMENT & EDUCATION

- ACROSS THE USA 25.00
- ATI TRAINING PACKAGES ..... ea. 55.00
- ATTACK ON ALTAIR 29.00
- BIG TOP 27.00
- CONQUEST 29.00
- COSMIC CRUSADERS 27.00
- DEADLINE 37.00
- DIGGER 29.00
- THE EXTERMINATOR 29.00
- FLIGHT SIMULATOR–NEW VERSION 35.00
- FRIENDLY ARCADE 29.95
- FRIENDLY PC INTRO SET 29.95
- FROGGER 25.00
- GORGON 29.00
- HI RES #4 ..... 27.00
- KID STUFF 32.00
- MASTER MINER 27.00
- MILLIONAIRE 49.00
- MOON BUGS 29.00
- MY LETTERS, NUMBERS & WORDS 32.00
- PC CRAYON 39.00
- INTRO TO OPERATING SYSTEM 49.00
- PLANET FALL 39.00
- SERPENTINE 25.00
- SNACK ATTACK 27.00
- SPINNAKER SERIES ..... CALL
- SUSPENDED 39.00
- WITNESS 39.00
- WIZARDRY 39.00
- ZORK I, II, III ..... ea. 27.00
- ZURAN DEFENDER 25.00

ACCESSORIES

CURTIS PRODUCTS
- DISPLAY PEDESTAL 35.00
- MONO CABLE 38.00
- KEYBOARD CABLE 30.00
- SYSTEM STAND 17.00

- COLOR CABLE 45.00
- SURGE PROTECTORS ..... CALL
- KRAFT JOYSTICK 39.00
- HAYES MACH III JOYSTICKS 45.00
- KEYBOARD DRAWER 75.00

MONITORS

- AMDEK 310A $175.00
- PRINCETON GRAPHIC HX-12 ..... 479.00
- SR-12 ..... CALL
- MAX-12 ..... 179.00
- ZENITH RGB MONITOR 479.00

MODEMS

- HAYES SMART MODEM $205.00
- HAYES SMART MODEM 1200 ..... 479.00
- HAYES SMART MODEM 1200B 419.00

DISKETTES

	SS/DD	DS/DD
DYSAN	24.00	34.00
MAXELL	23.00	33.00
VERBATIM	22.00	31.00
WABASH		25.00
VERBATIM HEAD CLEANING KIT		10.50

PRINTERS

- DIABLO 630 ..... $1699.00
- DIABLO 630 TRACTOR FEED 249.00
- DYNAX DX-15 ..... CALL
- IDS PRISM 132 COMPLETE 1499.00
- OKIDATA 92P 93P / 84P ..... CALL
- TOSHIBA P1351 ..... 1289.00
- EPSON FX SERIES ..... CALL
- NEC 3550 ..... 1549.00
- PRINTER CABLE/PARALLEL 25.00

CORPORATE ACCOUNTS POLICY

We honor purchase orders from major corporations listed on stock exchanges, governmental agencies and universities.

PLEASE ADD 10% to the listed prices for purchases with purchase orders.
OUR TERMS ARE NET 10 DAYS.

It is our policy not to advertise names of corporations who purchase from us.

CALL TOLL FREE 800-221-0343

All prices listed in this ad are effective Nov. 1-30, 1984. All Brands are Registered Trademarks. IBM is a Registered Trademark of IBM Corp.

IN NEW YORK CALL 1-212-730-8036

TERMS AND CONDITIONS

We reserve the right to repair replace or return to manufacturer for repair, all goods acknowledged faulty or damaged on receipt by customer ***Customer must call for Return Authorization Number before returning any goods.*** Prompt attention will be given to all damaged and faulty returned goods Any goods returned for credit are subject to 10% restocking charge, plus shipping charge No returns for credit on any software. Customer must deal with the manufacturer directly if the customer finds any false claims made by the manufacturer All goods are shipped U PS only Add 2% of price, or minimum of $3.00 for shipping Shipping charges on Printers & Accessories vary We do not ship C O D Please allow one to two weeks for personal or corporate checks to clear To expedite shipping send money order, certified cashier's check, or charge to your **VISA, MasterCard, WE DO NOT Add a Service Charge For Credit Card Usage.** Prices subject to change without notice. NOT RESPONSIBLE FOR TYPOGRAPHICAL ERRORS

home computer. There is too much technical detail about things like transient program areas, basic control modules, and RS-232 interfaces, and yet, when the authors discuss keyboards, they never differentiate between membrane keyboards and standard, typewriter-style keyboards, an issue much more pertinent to the family computerist. The discussion of software applications totally ignores the kids' market, and the book makes no mention of Logo in its discussion of computer programming languages.

The Baldwins and Fingerle write well, and their book contains some excellent guidelines for making an intelligent computer purchase, getting set up at home, and finding a base for continuing support. Still, I would have to say that *The First Family Computer Book* is by no means the first, nor does it truly address the family.

Better Than a Babysitter

Finally, here's a book for parents who would rather leave the learning to the kids. *Kids' Computer Capers* is a fine example of what imaginative and creative educators can offer children. Your children will find themselves trapped inside a cold stone room in the pirate Red Beard's old house.

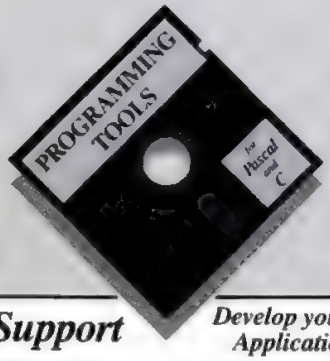
As the kids read on to discover how to escape from the house, they'll also discover how to write a BASIC program. Kids will learn what the binary code is, how chips are made, and other computer-related goodies. The pages are chock full of games, teasers, and minimysteries that reinforce important computer concepts, even as they provide plenty of entertainment.

So remember, when the going gets rough, the parent can give up and leave the reading to the kids. ■

FACT FILE

Kids' Computer Capers: Investigations for Beginners
Sandra Markle
William Morrow & Company, Inc.
105 Madison Ave.
New York, NY 10016
(212) 889-3050
Copyright: 1983
Cover Price: $6.95
ISBN: 0-688-02429-7

CIRCLE 797 ON READER SERVICE CARD



Pascal Support

Microsoft (IBM)Pascal is an effective tool for serious application development. Powerful abstract data capabilities, block structure, modular compilation, and direct memory addressing produce code that runs fast, and is easy to maintain. The Blaise Computing Programmer Productivity Series makes this environment even more attractive and speeds completion of your systems. You can obtain these tools from us for a fraction of the cost of developing them yourself. Source code is either included or available with each package, so you can make modifications easily. No royalties are required for incorporating our routines into your systems.

Blaise Computing's Pascal products have been reviewed favorably many times during their two years on the market, and in a recent survey, our users report them to have been extraordinarily valuable.

- **Pascal TOOLS™** is a library of procedures including powerful string manipulation, screen and keyboard handling, and graphics primitives. There are also a command line parser, a general BIOS gate for easy use of all hardware services, and many other features. **$125**

Develop your Applications Quickly

- **Pascal TOOLS 2™** gives access to the advanced operating system services of DOS 2.0 and later versions. Your Pascal program can retrieve DOS system information, perform full memory management, and execute other programs. There is a general gate to access all DOS services, and specific procedures are provided for handling files, directories, and disk I/O. **$100**
- **VIEW MANAGER™** is our display screen management system that makes screen development and documentation much faster. A complete library of Pascal procedures implements block mode data entry and transmission. Information can be captured or recalled, and context-relevant help files displayed with simple procedure calls. **$275**
- **ASYNCH MANAGER™** is a library of interrupt-driven routines providing a general interface to both COM ports for your asynchronous communications applications. Introductory price of **$175** includes all source.

Blaise Computing's Programmer Productivity Series is also available in versions for the C language.

BLAISE COMPUTING INC.
2034 Blake Street Berkeley, CA 94704
(415) 540-5441

CIRCLE 150 ON READER SERVICE CARD

Spending more time searching for the technology...than using it?

DATA SOURCES systematically organizes all your DP options!

No other resource puts over 20,000 systems and applications software packages...over 17,000 hardware and data communications products...and some 9,000 company profiles instantly at your fingertips.

DATA SOURCES is conveniently indexed to help you locate the products you seek quickly...find others you may not be aware of...and determine their capability and compatibility at a glance. You'll use...

...The Product Index, with its complete listing of every product covered by DATA SOURCES, to lead you to the larger listing quickly.

...The Company Profile Index, to help you identify all the product areas in which a firm is currently involved easily.

...The Company/Product Index, to find each vendor's full range of products within each equipment category instantly.

...The Software Index, to help you access specific packages, even if you're not sure of the author or product classification.

And DATA SOURCES' handy comparison charts let you review similar products by multiple manufacturers for key criteria, including compatibility and price.

PLUS...in-between quarterly editions, subscribers have access to the exclusive DATA SOURCES HOTLINE for information on product location assistance.

JUST CALL (800) 227-1617 ext 251 TODAY! (In California, call (800) 722-3543 ext. 251)

We'll send your first 2-volume edition on a 30-DAY APPROVAL basis and enter your year's subscription to DATA SOURCES at just $150...$60 off the regular cover price...FOR 4 quarterly editions.

DATA SOURCES

Leading the Industry in Information Management

P.O. Box 5845, Cherry Hill, N.J. 08034

T343

CIRCLE 176 ON READER SERVICE CARD

NORTHEASTERN SOFTWARE

Look for us in every second issue!

88 Ryders Lane, Stratford, Connecticut 06497

- **Up to 50% off / software purchases over $300 an additional 2% off**
- **New larger facilities to serve you better**
- **School & corporate purchase orders accepted**
- **No additional charges for credit card orders**

Products for IBM

Entertainment

ARMONK	
Executive Suite	27.00
ATARISOFT	
Defender	28.00
Centipede	28.00
Dig Dug	28.00
Donkey Kong	28.00
Joust	28.00
Jungle Hunt	28.00
Moon Patrol	28.00
Ms Pac Man	28.00
Pac Man	28.00
Pole Position	28.00
Robotron	28.00
Stargate	28.00
EPYX/AUTOMATED SIMULATIONS	
Crush Crumble & Chomp	21.00
Temple of Apshai	28.00
Star Warrior	21.00
BLUECHIP	
Baron	38.00
Millionaire	38.00
Tycoon	38.00
BRODERBUND SOFTWARE	
Lode Runner	23.00
Serpentine	23.00
FUNTASTIC	
Big Top	28.00
Cosmic Crusaders	28.00
Master Miner	[illegible]
HAYDEN	
Sargon III	[illegible]
INFOCOM	
Deadline	29.97
Enchanter	29.97
Infidel	29.97
Planetfall	29.97
Sorcerer	29.97
Starcross	27.00
Suspended	29.97
Witness	29.97
Zork I	27.00
Zork II	27.00
Zork III	27.00
Seastalker	27.00
MICRO LAB	
Miner 2049er	25.00
Death in the Caribbean	25.00
The Heist	25.00
MICROSOFT	
Flight Simulator	37.00
ODESTA	
Chess	45.00
Backgammon	35.00
ORIGIN SYSTEMS	
Caverns of Callisto	24.50
Ultima III	39.00
ORION SOFTWARE	
J-Bird	28.00
PC-Man	24.50
Paratrooper	21.00
Pits & Stones	28.00
PJ SOFTWARE	
Armchair Quarterback	24.00
Championship Blackjack	24.00
Chess 2001	24.00
SEGA CONSUMER PRODUCTS	
Buck Rogers	29.50
Congo Bongo	29.50
Startrek	29.50
Zaxxon	29.50
SIERRA	
Frogger	24.00
Ultima II	38.00
Championship Boxing	24.00
SIRIUS SOFTWARE	
Buzzard Bait	24.50
Call To Arms	21.00
Gorgon II	27.00
SIR-TECH SOFTWARE	
Wizardry 1	38.00
STRATEGIC SIMULATIONS	
Battle for Normandy	29.00
The Warp Factor	29.00
Tigers In The Snow	29.00
SUBLOGIC	
Night Mission Pinball	26.00

Educational

ATI	
All training programs	48.00
BARRON'S EDUCATIONAL SERIES	
Computer SAT	55.00
CBS SOFTWARE	
College Board	115.00
Goren's Bridge	[illegible]
Mastering The SAT	99.00
Murder By The Dozen	24.00
Match Wits	20.00
CDEX	
All training programs	[illegible]
COUNTERPOINT SOFTWARE	
Early Games for Young Children	20.00
Early Games Fraction Factory	20.00
Early Games Match Maker	20.00
Early Games Piece of Cake	20.00
Quizagon	28.00
DAVIDSON & ASSOCIATES	
Mathblaster	33.00
Speed Reader II	49.00
Word Attack	33.00
DESIGNWARE	
Creature Creator	27.00
Crypto Cube	27.00
Math Maze	27.00
Spellicopter	27.00
Spellakazan	27.00
Spellagraph	27.00
[illegible]	
Alien Addition	24.00
Meteor Multiplication	24.00
Minus Mission	24.00
Demolition Division	24.00
Alligator Mix	24.00
Dragon Mix	24.00
EDUWARE	
Algebra 1	28.00
HARCOURT BRACE JOVANOVICH	
Computer SAT	56.00
Gre Test	53.00
HUMAN EDGE	
Management Edge	165.00
Sales Edge	165.00
Negotiation Edge	165.00
INFO WORLD	
Speed Read Plus	62.00
KNOWARE	
Knoware	64.00
LEARNING CO.	
Magic Spells	24.00
Moptown Hotel	28.00
Moptown Parade	28.00
Work Spinner	24.00
Addition Magician	24.00
MECA	
Basic Building Blocks	58.00
SCARBOROUGH	
Master Type	33.00
Run For The Money	33.00
SCHOLASTIC	
Turtle Tracks	28.00
SIERRA ON-LINE	
Dragon's Keep	21.00
Troll's Tale	21.00
SIMON & SCHUSTER	
Typing Tutor II	35.00
Wordivision	56.00
SPINNAKER SOFTWARE	
Alphabet Zoo	21.00
Delta Drawing	[illegible]
Face Maker	24.50
Fraction Fever	24.50
Hey Diddle Diddle	21.00
In Search of the Most Amazing Thing	27.00
Kindercomp	21.00
Rhymes & Riddles	21.00
Story Machine	24.50
Kids on Keys	24.50
Snooper Troops #1	24.97
Snooper Troops #2	24.97
UNICORN SOFTWARE CO.	
Ships Ahoy	28.00
Ten Little Robots	28.00
VISICORP	
VisiTutor	Call

Printers

BROTHER	
HR-25	745.00
C ITOH	
Prowriter 8510AP	319.00
Prowriter 8510 SP	485.00
DYNAX	
DX-15	435.00
EPSON	
FX 80	Call
FX 100	Call
RX 80 FT	Call
LQ 1500	Call
[illegible]	
Prism 80 (Basic)	1,055.00
Prism 80 (Full)	1,385.00
Prism 132 (Basic)	1,225.00
Prism 132 (Full)	1,655.00
Microprism	425.00
JUKI	
6100	445.00
MANASMAN TALLY	
MT 160L	509.00
MT 180L	795.00
MT Spirit	295.00
NEC	
NEC 2050	1,440.00
OKIDATA	
92 P	429.00
93 P	655.00
SILVER REED	
Exp 400	Call
Exp 500	Call
Exp 550	[illegible]
Exp 770	875.00
STAR MICRONICS	
Gemini 10X	Call
Gemini 15X	389.00
Power Type	355.00
Radix-10	620.00
Radix-15	720.00
TRANSTAR	
315	455.00

Monitors

AMDEK	
310A	175.00
[illegible]	147.00
300G	125.00
Color II Plus	425.00
PGS	
HX-12	467.00
Max 12	189.00
QUADRAM	
Quadchrome	Call
TEXAN	
RGB III	445.00
RGB 420	535.00
USI	
12" Green	125.00
12" Amber	142.00

Modems

ANCHOR AUTOMATION	
Mark XII 1200	269.00
Mark VI	169.00
HAYES	
Smartmodem 300	205.00
Smartmodem 1200	469.00
Internal 1200B	399.00
NOVATION	
Access 1-2-3	449.00
Smart Cat 103-212	415.00
J-Cat	99.00
PROMETHEUS	
Pro Com 1200	369.00

Blank Media

Elephant SS/DD	17.00
Verbatim SS/DD	[illegible]
Verbatim DD/DD	Call
Maxell SS/DD	23.00
Maxel DD/DD	[illegible]
Memorex SS/DD	21.00
Wabash SS/DD	18.00

Specials

CENTRAL POINT	
Copy PC	29.00
PETER NORTON	
Norton Utilities	52.00

Accessories

AST	
Six Pack Plus (64K)	285.00
Mega Plus II (64K)	345.00
Combo Plus II	285.00
I/O Plus II	Call
CHALKBOARD	
Power Pad	Call
Starter Kit	Call
ELEPHANT	
Flip N File	20.00
HERCULES	
Color Graphics	189.00
Monochrome Graphics	354.00
KENSINGTON	
PC Saver	[illegible]
Micro Saver	59.00
KEYTRONIC	
Keyboard 5150	159.00
KB 5151	189.00
KB 5151 Dvorak	189.00
KOALA	
Koala Pad	89.00
KRAFT	
Joystick	Call
MICROSOFT	
Ram Card 356K	385.00
System Card 64K	295.00
System Card 256K	450.00
[illegible]	145.00
PERSYST	
Color Graphics Board	[illegible]
Monochrome Board	[illegible]
PLANTRONICS	
Color +	Call
QUADRAM	
Quadlink	475.00
Quadboard I	215.00
Quadboard I (64K)	275.00
Quadboard II	215.00
Quadboard II (64K)	Call
Quad 512 (64K)	285.00
Quad Color I	215.00
Quad Color II Upgrade	[illegible]
RTG	
Super I/O	Call
Graphics Plus II	Call
Graphics Plus	Call
Rio-Plus (64K)	Call
SWEET ELECTRONICS	
Echo for IBM	Call
TG	
Joystick	Call
TALLGRASS	
Hard Disk	Call
THUNDERWARE	
Thunderclock	Call
TITAN	
Accelerator PC	750.00

Call on IBM Computers

Business

ALPHA	
Database Manager II	179.00
APPLIED SOFTWARE TECHNOLOGY	
Versaform	235.00
ASHTON TATE	
Friday	189.00
d Base II	299.00
d Base III	Call
ABX MICRO	
AP/AR/GL/Inv/PR	ea. 285.00
BPI	
General Accounting	385.00
AR/AP/Inv/PR	ea. 385.00
BEST PROGRAMS	
PC/Personal Finance Program	[illegible]
BIBLE	
The Word	129.50
CHANG LABS	
File Plan	190.00
Graph Plan	190.00
Memo Plan	190.00
Starter Kit (Memo/Graph/File)	497.00
CONTINENTAL SOFTWARE	
Home Accountant Plus	89.00
Property Management	320.00
FCM	79.00
The Tax Advantage	45.00
DIGITAL RESEARCH	
CPM/86	36.00
C Compiler (PC Dos)	218.00
Dr Logo	[illegible]
DOW JONES	
Market Analyzer	225.00
Market Manager	193.00
FINANCIER INC.	
Financier II	114.00
Tax Series	98.00
FOX & GELLER	
D Utility	[illegible]
Quickcode	145.00
FUNK SOFTWARE	
Sideways	42.00
HAYDEN	
Pie Writer	129.00
The Writer	[illegible]
The Speller	[illegible]
The Calendar	[illegible]
HOWARD SOFT	
Real Estate Analyzer II	165.00
INFORMATION UNLIMITED	
Easy Speller II	[illegible]
Easy Mailer II	67.00
Easy Writer II System	Call
LIFETREE SOFTWARE	
Volkswriter Deluxe	164.00
LIVING VIDEOTEXT	
Think Tank	119.00
LOTUS DEVELOPMENT	
1-2-3/Symphony	Call
MAIN STREET SOFTWARE	
Main Street Filer	179.00
MECA	
Managing Your Money	129.00
MICROPRO	
Wordstar Packages	Call
MICRORIM	
R base 4000	275.00
Clout	124.00
MICROSOFT	
Multiplan	124.00
Word	[illegible]
Word With Mouse	285.00
MICROSTUF	
Crosstalk XVI	105.00
MONOGRAM	
Dollars & Sense	96.00
PBL	
Personal Investor	99.00
PEACHTREE	
Peach Pak (GL/AR/AP)	195.00
PEARLSOFT	
Personal Pearl	191.00
Accounting Pearl	580.00
PROFESSIONAL SOFTWARE	
Word Plus	Call
Word Plus Jr	Call
Word Plus With The Boss	Call
SOFTWARE PUBLISHING	
PFS Report	79.00
PFS Write	79.00
PFS Graph	79.00
PFS File	81.00
SORCIM	
Super Calc II	149.00
Super Calc III	210.00
Superwriter	191.00
VISICORP	
Visi Packages	Call

If something you would like is not listed, just call. For Inquiries and Connecticut Orders Call (203) 268-1850

VISA

MasterCard

For Fast Delivery send cashier's check, certified check or money order. Personal and company check allow 3 weeks to clear. Shipping - Software ($2.50 minimum). C.O.D. add an additional $1.75. Shipping - Hardware (please call). Alaska, Hawaii, Canada, PO, APO and FPO $5.00 minimum. Foreign orders - $15.00 minimum and 15% of all orders over $100. Mastercard & Visa (include card # and expiration date). Connecticut residents add 7.5% sales tax. We ship same day for most orders. Prices subject to change without notice. School purchase orders accepted. All returns must have a return authorization number. Call 203-268-1850 to obtain one before returning goods for replacement.

ORDERS ONLY - TOLL FREE
7 DAYS/WK 9AM to 11PM EST
1-800-382-2242

CIRCLE 120 ON READER SERVICE CARD

PC Takes the Case

With a PC and a good database management package, even a solo practitioner can afford to automate the tracking and retrieval procedures for thousands of litigation documents.

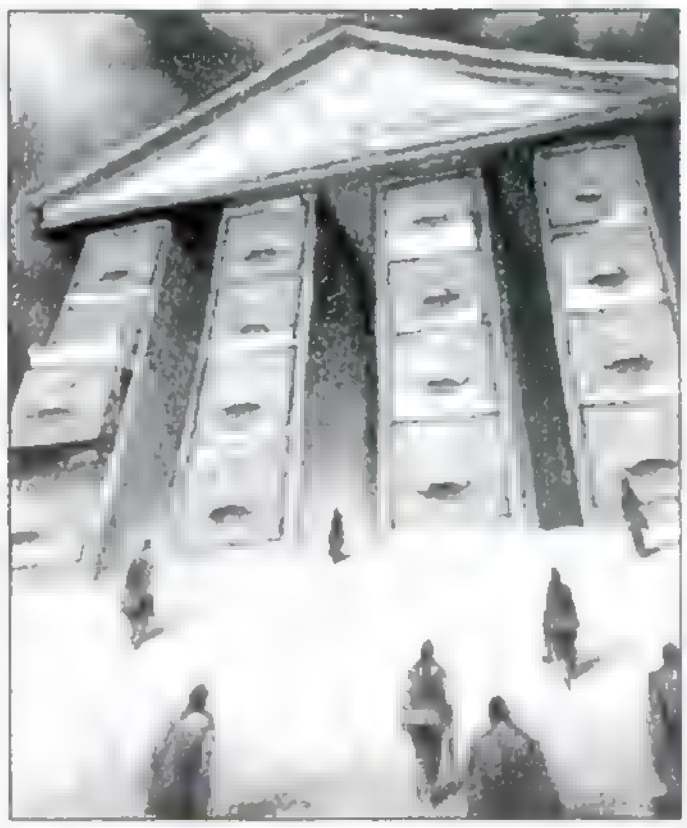
During the final hours of trial preparation, after more than 5 years of litigation, your co-counsel suddenly recalls seeing a memo about the Graham Point contract that explains certain key actions of the opposition. This memo could be the missing link for which you have been searching. Unfortunately, your comrade does not remember where the memo is located among the 200,000 documents that you have accumulated over the course of this litigation.

You turn to your computer, enter the word *Graham*, and within minutes you have a complete abstract of the document, together with its identifying number. Thirty seconds later, the document is in your hand. This instant retrieval capability is what computerized litigation support is all about.

It isn't unusual for a lawsuit to generate thousands of depositions, statements, and other pieces of paper. As you amass documents, you must organize them so they can be retrieved easily.

Manual Systems

For starters, you need to know the order in which the documents were written and who is mentioned in each one. You could maintain an extra set of the documents in chronological order in a separate file and then insert new documents



into this group as you discover them.

The simplest manual way to keep track of all of the people involved in a lawsuit is to prepare an index card for each person and list the documents in which he or she is mentioned. Similarly, you could keep an index card for each subject and cross-reference these to document numbers and people. Even for such a relatively simple manual system, the amount of paperwork is immense. Also, the information that can fit on an index card is obviously limited.

Computerized litigation support systems are more accurate, far more flexible, and much faster than manual systems. Accuracy is perhaps the most important and obvious advantage. If the data is entered correctly, the computer cannot miss it when looking for a particular item. Computer systems are also more flexible. You can't always predict in what order or form you'll need information at a later date. If, for example, an individual you originally deemed unimportant suddenly becomes a focal point of the case, instead of going through all that paper again, you can simply have your computer search for references to that individual.

To set up a computerized litigation support system, you need not buy expensive software especially designed for this purpose. Almost any commercial database management program will work. It's important, however, to choose one that lets you create your own input forms. Figure 1 is an actual input form I developed for use with the database management program *DB Master*.

Important Fields

Let's take a look at the fields in Figure 1. These are the categories I have found most important, but you may want to include other information as well, such as references to trial exhibits, deposition exhibits, confidential memoranda, and custodians of originals.

Each piece of paper should have a separate identifying number. While it may

Illustration: Carter Goodrich

Lease Vs Purchase Analyzer

$395 $395

Should you purchase? Should you lease?

- Comprehensive analysis • Easy to use
- Clear concise answers • Purchase conversions
- Immediate savings

What effect do INTEREST CHARGES have on the cost of ownership?

What are the REAL COSTS of the monthly payments in TODAY'S DOLLARS?

What are the effects of FEDERAL, STATE, and CITY INCOME TAXES?

What are the BOTTOM LINE effects of ITC, WARRANTY PERIODS, and PERSONAL PROPERTY TAX?

Have you considered the EFFECT of RESIDUAL VALUES? STATE SALES TAX? DOWN PAYMENTS?

How does the LEASE TERM affect the lease/purchase decision?

What effect will LEASE EXTENSIONS or RENEWALS have on the acquisition alternatives?

How do DISCOUNTS on LEASE EXTENSIONS or RENEWALS affect your decision?

If you are on lease, SHOULD YOU REMAIN ON LEASE? SHOULD YOU PURCHASE? What effect do PURCHASE ACCRUALS have on your decision?

What effect does the ASSET LIFE have on the COST OF OWNERSHIP?

NOW IN BASIC

No other software required.
Runs on IBM-PC and compatibles.

TELEPHONE 813-273-1894

SOFTWARE SERVICES of Tampa, Inc.

4419 RANCHWOOD LANE • TAMPA, FLORIDA 33624

CIRCLE 195 ON READER SERVICE CARD


```
                    DOCUMENT SUMMARY FORM

PREFIX_ _ _                          NO _ _ _ _ _ _ _ _ - _ _ _ _ _ _ _
(Co. producing doc, e.g.,            (Beginning & ending nos. of
CE, LNB)                             summarized documents)

DATE_/_/_                            TYPE_ _ _ _ _
(In YY/MM/DD format)                 (LTR, MEMO, etc.)

                                     VID (Y/N) __
                                     (Very Important Document)

NAME 1 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
NAME 2 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
NAME 3 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
NAME 4 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
NAME 5 _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
(Names of authors, addressees, and people and companies mentioned
in text - last name, first initial)

CODE 1__ 2__ 3__ 4__ 5__ 6__
(Subject codes applicable)

TITLE _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
(Descriptive title of document)

SUMM 1_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
SUMM 2_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
SUMM 3_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
SUMM 4_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
SUMM 5_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
(Concise summary of important facts)
```

Figure 1: *Sample data entry form for a litigation support system.*

seem logical to assign a single number to a 10-page report, such a system ultimately leads to confusion when references are made to pages within a document or if a particular page is missing.

The Prefix field tells you the source of the document. For example, if IBM gave you a document, its prefix can be IBM. Samuel Langhorne Clemens's notes would begin with SLC-1.

Probably the single most important use of a computerized litigation support system is in arranging information chronologically and printing out a summary of that listing. The Date field in Figure 1 accepts dates in the YY/MM/DD format (a peculiarity of *DB Master*).

The Type and VID (very important document) fields, though not essential, can be powerful aids. In the Type field you would identify the type of document by entering, for example, INV for invoice or CON for contract. Later, you could use this field to locate all contracts signed by a particular person or all invoices sent to one customer.

The VID field can take a yes or no response, as it does in the Figure 1 example, but some attorneys prefer to enter a number from 0 to 9 to reflect the impor-

tance of a specific document.

The names of the authors and recipients and of people and companies mentioned in a document and their addresses are as important as the chronology. Prior to taking a witness's deposition, you can run a report that summarizes chronologically every document in which that person is mentioned.

Codes

Most cases can be broken down into a finite number of factual disputes or issues that can be assigned a number or letter code in the Code field. When you retrieve a document, many programs allow you to use look-up tables for the codes; then print the full text of the issue description instead of just the code letter.

The Title field below the Code field is useful if you decide that a certain printout does not require full summaries of all of the documents. This feature is handy for a quick reference listing of documents.

Although database systems on mainframes sometimes do full-text retrieval of every word in a document, most micro systems rely on some form of summary or abstract to distill the contents of the document. This abstract also helps in ensuring that the computer system is considered a part of the "work product" of the attorneys and not documentation discoverable by the other side.

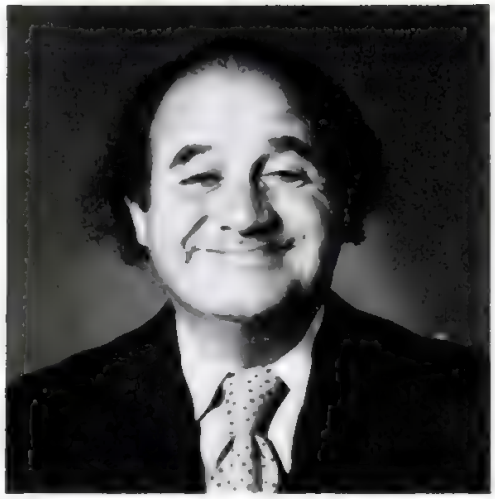
Computerized litigation support is no longer the private domain of large firms and multibillion dollar clients. If you already have a PC, your only out-of-pocket expense is the software—and you may already have a database management program that you can use. With a PC and a powerful database program, even a solo practitioner can gain a significant edge over the competition. ■

Thorne D. Harris III is a New Orleans attorney involved in all aspects of computer law and the use of microcomputers. He is the author of The Legal Guide to Computer Software Protection *(Prentice-Hall).*

CIRCLE 235 ON READER SERVICE CARD

BEAUTIFUL STREAMER.

Introducing PC-QICTAPE. Total data protection with streaming efficiency and file-oriented format for IBM PC and 100% compatible users.



Alloy's PC-QICTAPE gives high capacity, high speed, streaming cartridge tape backup to users of IBM PC, PC/XT, Compaq, Tava, Columbia, and Corona. But unlike other streaming tape subsystems, PC-QICTAPE gives you all the advantages of file-oriented tape backup to support the speed, storage capacity, and low cost of a streaming tape drive. With up to 41 MBytes on a single tape cartridge, you can save large capacity disk files at up to 2 megabytes/minute on just one tape cartridge. PC-QICTAPE comes with QICTIP, the streaming tape version of TIP-SIX, Alloy's powerful, easy-to-use, file-oriented tape backup and restore software proven in over 30,000 installations. Awaken your PC with the beautiful streamer from Alloy. See PC-QICTAPE in action at Computerland,® Businessland, and at your local dealer. Or call Alloy today at (617) 875-6100.

ALLOY
Computer Products, Inc.

COMDEX™/Fall '84
November 14-18, 1984
Las Vegas Convention Center

Alloy Computer Products, Inc., 100 Pennsylvania Avenue, Framingham, Massachusetts 01701. (617) 875-6100, TWX: 710-346-0394
In Europe: Alloy Computer Products (Europe) Ltd., Cirencester, Gloucestershire, England. Tel: 0285-68709, Tlx: 43340

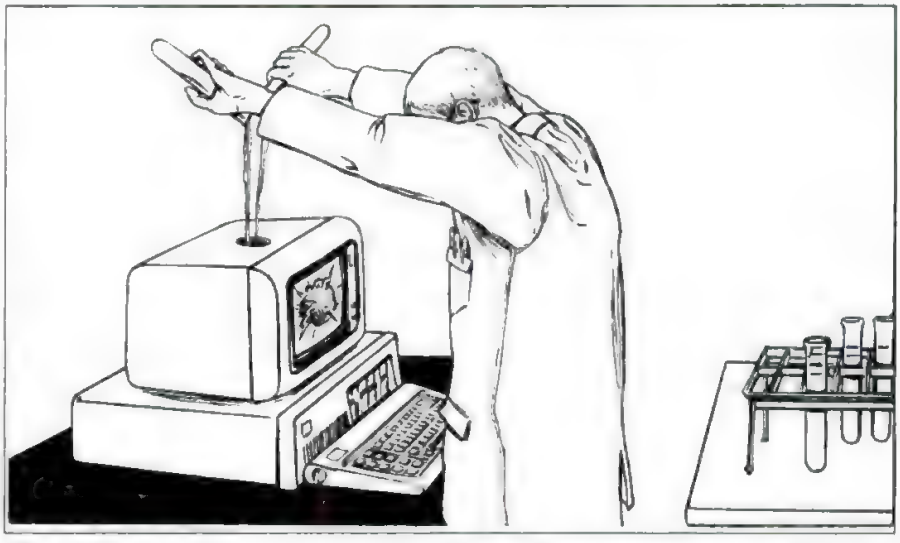
CIRCLE 106 ON READER SERVICE CARD

For Chemical Engineers: New PC Software

Chemical engineers are finally getting some good software of their own for the PC. These three new programs handle tedious problems and offer powerful design support.

Most engineering software for the PC is for electrical engineers—after all, they invented personal computers. But new software is expanding the usefulness of the PC for chemical engineers as well.

Chemical engineers design processes that change the properties of chemicals. They design in three steps: determining the physical properties of the chemicals, specifying the processes (called "unit operations"), and tying together the various unit operations into a factory. Most other engineers deal with static or steady-state conditions; chemical engineers deal with dynamic processes. By reducing dynamic processes to steady-state conditions in computer simulations, chemical engineers can make good use of the PC, especially at physical-property or unit-operation stages.



PC FACT FILE

FlashCalc 1.00
Process Systems International
RD #3 Foxchase-Friendship Road
Vincentown, NJ 08088
(609) 268-0571
List Price: $700
Requires: 128K RAM, one double-density disk drive, an 80-column monitor, and a printer.

CIRCLE 785 ON READER SERVICE CARD

FlashCalc

FlashCalc 1.00 from Process Systems International determines equilibrium conditions when chemicals or mixtures of chemicals are heated or distilled. It performs nine calculations: bubble-point temperature and pressure, dew-point temperature and pressure, flash temperature and pressure, liquid fraction (for specified conditions), flash temperature (at a specified energy level), and flash curve from bubble to dew point. The last function, flash curve, can be calculated either as a condensation or a vaporization curve. In either case, however, the output is simply a listing of points along the curve in increments you define. Unfortunately, the curve is not plotted.

Process Systems International has gone out of its way to make the program usable quickly. Included is a library of 87 compounds that range from methane to acetylene derivatives with most common aromatic and monomer hydrocarbons in between. Each entry lists the necessary specific gravity, critical temperature and pressure, and other datapoints. You can also add your own entries to the library.

For a calculation of flash conditions, *FlashCalc* can handle up to 20 components mixed together. The calculations are carried out by standard engineering formulas: the Chao-Seeder method for computing equilibrium K values (as

Illustration: Kimberly Root

NOW, THE LOWEST PRICES EVER ON

3M Scotch® DISKETTES

$1.58 ea. 5¼" SSDD Qty. 50
$2.10 ea. 5¼" DSDD Qty. 50
$2.33 ea 5¼" SSDD-96TPI
$2.94 ea 5¼" DSDD-96TPI

SOFT SECTOR ONLY!
MINIMUM ORDER: 20 DISKETTES
These are factory-fresh 3M diskettes packed in boxes of 10 with Tyvek sleeves, reinforced hubs, identification labels and write-protect tabs.
Add 5% for orders less than 50 on 5¼" only.

LIFETIME WARRANTY! ON ALL 3M SCOTCH DISKETTES!

SUPER SPECIAL!

Order 50 3M Scotch Diskettes on this special offer and you can get an Amaray Media Mate 50 for only $9.99 (shipping included). Normally, a $14.95 retail value, this is one of the best designed disk storage units we've seen. Special slots and ridges for stacking. A great buy.
With 50 3M Scotch 5¼" Diskettes $9.99
Ordered alone: $10.95 + $2.00 Shpng.

8" 3M Scotch Diskettes
8" SSSD $2.05 ea. 8" SSDD $2.50 ea.
8" DSDD $3.10 ea
SOFT SECTOR ONLY!
MINIMUM ORDER 8" DISKETTES. 20

3M HEADCLEANING KITS
Stop swearing and start cleaning. This non-abrasive cleaning kit has everything you need for 30 applications. $18.00 + $1.50 Shpng

DISKETTE 70 STORAGE: STILL A GREAT BUY
Dust-free storage for 70 5¼" diskettes. Six dividers included. An excellent value. $11.95 + $3.00 Shpng

DISK CADDIES
The original flip-up holder for 10 5¼" diskettes. Beige or grey only.
$1.65 ea + 20¢ Shpng

PRINTER RIBBONS AT BARGAIN PRICES!
Brand new ribbons produced to manufacturer's specs
Epson MX-70/80 ..... $3.58 ea. + .25 Shpng
Epson MX-100 ..... $5.99 ea. + .25 Shpng
Okidata Micro 83 ..... $1.48 ea. + .25 Shpng
Okidata Micro 84 ..... $3.66 ea. + .25 Shpng

Shipping: 5¼" DISKETTES—Add $3.00 per 100 or fewer diskettes. 8" DISKETTES—Add $4.00 per 100 or fewer diskettes. Other Items: Add shipping charges as shown in addition to diskette shipping charges. Payment: VISA and MASTERCARD accepted. COD orders only, add $3.00 handling charge. Taxes: Illinois residents only, add 8% sales tax.

FOR ORDERS ONLY:
1-800-621-6827
(In Illinois 1-312-944-2788)
INFORMATION & INQUIRIES:
1-312-944-2788 only!
HOURS: 9AM - 5PM Central Time, Monday - Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Distributor Information Processing Products 3M

330 CIRCLE 143 ON READER SERVICE CARD

modified by Greyson-Steed), the Redlich-Kwong formula for vapor-phase enthalpies, and the Yen-Woods method for liquid-phase enthalpies.

The program's main limitations are that it can only handle temperatures from 0 to 900 degrees F and pressures from 14.7 to 1,000 psi. Also, calculations greater than 600 psi or below 60 degrees F may be inaccurate (a limitation of the formulas rather than the program), and you need to know in advance about the potential existence of azeotropes. Finally, *FlashCalc* treats all water fractions as totally miscible in hydrocarbons, an acceptable assumption for small amounts of water but inaccurate for larger amounts. To the program's credit, it flashes warning messages when critical properties are exceeded.

Flow Network Analysis

When a typical chemical engineer gets a bunch of chemicals, the first thing he or she wants to do is shoot them through pipes into the processing equipment. Such pipe networks are the meat of *Flow Network Analysis (FNA)* from Kelix Software Systems. Starting with the assumption that the chemical of interest is a single-phase, incompressible fluid flowing in a circular pipe (a large assumption), the program allows you to compute the pressures and flows through a network of up to 90 nodes (pipe ends or pipe intersections) among 225 pipes.

PC

Flow Network Analysis
Kelix Software Systems
11814 Coursey Blvd., Suite 220
Baton Rouge, LA 70816
(504) 769-6785
List Price: $99 for one-time purchase of software and documentation; $199 includes telephone support and continual updates.
Requires: 128K RAM, BASICA, one double-density disk drive.

CIRCLE 786 ON READER SERVICE CARD

Like *FlashCalc*, *FNA* has no graphics capability, so the first thing you must do is make a pencil drawing of the network and label each pipe and node with a code number. You must also specify the physical properties of the fluid you are piping, the dimensions of the pipes, and the pressures at selected nodes.

The program then goes into a calculation mode using standard engineering formulas: the Church or Hazen-Williams formulas for calculating friction factors, the "multiple K" method for the effects of fittings and valves, and a set of nonlinear simultaneous equations for calculating network flows. You must then perform several iterations to work out all the nodal pressures and flows; *FNA* offers two methods of making the equations converge—the sequential or the simultaneous. You can switch between the two to get the fastest convergence.

HYSIM

FlashCalc and *FNA* are both good, if limited programs, but *HYSIM* from Hyprotech, priced at a cool $12,000, is a whole new ballgame. If your cash flow can't handle this, Hyprotech will lease *HYSIM* for $640 a month.

HYSIM is geared toward unit-operation design and perhaps can even handle small but complete chemical plants. It has programs like *FlashCalc* and *FNA* embedded in it. For instance, whereas *FlashCalc* can perform flash calculations on its library of 87 components, *HYSIM* can do the same on its library of 50 components (as in *FlashCalc*, you can specify your own additions to the library). But of course, *HYSIM* goes far beyond *FlashCalc*. It can perform heat and mass balance calculations around a long list of chemical-processing systems that includes heat exchangers, compressors, fractionators, reactor mass balances, distillation columns (under both short-cut and rigorous analyses), three-phase separators, coolers, heaters, valves, pipe manifolds, and recycle streams.

In a typical session with *HYSIM*, you

BIG TIME STATISTICS GO SMALL

Statpro™ brings the power of mainframe statistics to your personal computer.

Until now, serious statistical analysis meant mainframes, computer centers and a lot of extra work for you.

Enter Statpro, the most powerful statistical software system ever developed for personal computers.

It lets you do almost everything you do on a mainframe on your IBM® or Apple® personal computer. Including descriptive statistics, regression, ANOVA, factor and cluster analysis, to name just a few capabilities.

And Statpro's awesome power isn't limited to number crunching. You can plot all your results in four-color graphics, such as scatter, triangle and regression plots, dendrograms, histograms and pie charts.

What's more, Statpro has sophisticated database management capabilities which make entering, manipulating, transforming and editing data quick and easy.

Most important of all, you get this incredible power in one integrated, fully documented, easy-to-use package for only $795.

Discover Statpro's capabilities for yourself. Call us toll-free today to order a Statpro demonstration package. We'll have it on its way to you within 24 hours.

800-322-2208

In Massachusetts call (617) 423-0420.
Or call your local dealer.

Wadsworth Professional Software

Statpro is a trademark of Wadsworth Professional Software, Inc. Apple is a registered trademark of Apple Computer, Inc. IBM is a registered trademark of International Business Machines Corp.

CIRCLE 193 ON READER SERVICE CARD

might begin by specifying a processing stream—say, vacuum-distilled petroleum. The physical-property portions of the program would calculate the energy content, phase, and other properties of this stream. To distill it, you enter the command column, and the program shifts to this unit operation. In an interactive manner, you begin specifying the design of the distillation column. The program responds with workups of the properties of the stream being processed. You can specify as much as you want about the system, but if you enter contradictory data, the program asks for clarification. At the end of this process, you have the petroleum distilled to the conditions you want, with all the mass and energy flows specified.

HYSIM can instruct the PC to refrain from recalculating until all the changes have been specified and to isolate a particular part of a system, recalculate its parameters, and only then integrate it into the rest of the system.

HYSIM is only adequately documented; but most of the documentation consists of examples. Besides the documentation, Hyprotech sends you monthly update newsletters (and apparently the entire program is steadily updated with new enhancements) and has set up an 800 number you can call. Also, the company claims that a perplexed user can get an on-the-spot consultation via a modem linkup.

HYSIM can draw graphs of some data it generates, but it doesn't let you draw your process or flow scheme on the PC screen. Back to pencil and paper for that.

HYSIM looks like a great program, and, for the price, it had better be. It seems to represent a real breakthrough in the design power chemical engineers can get with PCs. ■

THE FILE CONNECTION

8" DISKETTE SYSTEM FOR THE IBM PC

Our "FILE CONNECTION" programs provide 8" diskette file exchange between the IBM PC and most Micro-Mini-Main Frame computer systems.

Our "WORD CONNECTION" programs provide 8" diskette text document exchange between the IBM PC and many word processing systems.

Our "DISPLAYWRITER CONNECTION" programs transform documents from Textpack, Wordstar, Multimate, etc. to the new DisplayWrite 2 format.

In addition to our hardware and program products, we also provide a conversion service for customer supplied diskettes. Please contact us for information about the hundreds of 5¼" and 8" diskette formats and systems which we currently support.

FLAGSTAFF ENGINEERING / 2820 West Darleen / Flagstaff, AZ 86001
Telephone 602-774-5188 / Telex 705609 FLAG-ENG-UD

CIRCLE 181 ON READER SERVICE CARD

HYSIM
Hyprotech, Ltd.
1700 Varsity Estates Dr. N.W.
Calgary, Alberta T3B 2W9
(403) 288-1718
List Price: $12,000
Requires: 512K RAM, 8087 coprocessor, two double-density disk drives (hard disk recommended). A game adapter card is provided.

CIRCLE 787 ON READER SERVICE CARD

SOMETHING FOR YOUR WRIST THAT WILL BLOW YOUR MIND.

THE SEIKO® PC DATAGRAPH:
A Computer Terminal For The IBM®-PC.

Markline proudly presents The Seiko PC Datagraph — a fine quartz watch with an on-board microprocessor and 2K RAM you can use to store and recall data entered directly from your IBM-PC or PCjr.

Store data in up to 12 separate files — recall it anywhere. Use it like a personal notebook, with files for phone numbers, travel schedules, key dates — any kind of information you can think of.

Set the alarm a year in advance — your PC Datagraph displays a preprogrammed message the moment it sounds. There's also a Weekly Alarm file for daily scheduling, and a World Time file that tells you the time all over the world.

A powerful word processing/scheduling software program — makes data input a breeze. The 5¼" floppy disk is formatted for the PC Datagraph memory and functions. And a special cable connects directly to your computer's RS232C serial port.

It's the most sophisticated timepiece ever developed — which is exactly what you'd expect from Seiko. Because when it comes to new ideas, the world is coming to Seiko.

SEIKO
What the world is coming to

Order from
MARKLINE

The Seiko PC Datagraph
Order No. SERC1000

$120.00 plus $7.25 shipping & handling (Sales tax: MA 5%)

Order by Phone: Call toll-free, 24 hours a day — **1-800-225-8493/8390**
In Massachusetts call: (617) 891-6495
Order by Mail: Just fill out this coupon and return to
Markline/PO Box C-5/Belmont, MA 02178

Type of Computer ☐ IBM®-PC/PCjr. ☐ Apple® II/IIe/IIc
☐ Tandy Model 100 ☐ Commodore 64™

Method of Payment ☐ American Express ☐ Visa ☐ MasterCard
☐ Diners Club ☐ Carte Blanche

Card No. _____ Exp. date _____

Phone _____

Cardholder signature _____

Name _____

Address _____

City/State/Zip _____

Please call the above number toll-free if you have any questions about the Seiko PC Datagraph. **Markline: 11 years of experience and over 1,000,000 satisfied customers.**

IBM® Apple® Tandy® and Commodore™ are trademarks respectively of International Business Machines Corp., Apple Computer Inc., Tandy Corp. and Commodore Inc.

© 1984 Hattori Corporation of America

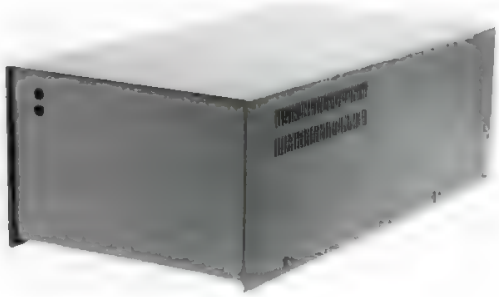
CIRCLE 211 ON READER SERVICE CARD

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

PRICE BREAKTHROUGH

SUPER SALE ON NEW MEGADISK™ DRIVES

New hard drive systems for your: { **TRS/80 MODELS** I//III/IV/4P/COLOR COMPUTER - APPLE - FRANKLIN - LNW - IBM/PC - MAX/80 - HEATH/ZENITH



IBM/PC internal/external systems
starting at $799.95 - 10 MEGABYTES

TRS/80 and TRS/80 compatible
starting at $999.95 - 10 MEGABYTES

APPLE/FRANKLIN
starting at $1,099.95 - 10 MEGABYTES

READY TO RUN: Complete with all necessary hardware, software drivers and easy to follow 10 minute installation guide.

TOLL FREE ORDERING
1-(800)-343-8841

GENERAL INFORMATION
1-(617)-872-9090

COMPONENT PARTS:
HOST ADAPTERS WITH SOFTWARE DRIVERS, POWER SUPPLIES, HARD DRIVES, CONTROLLERS-XEBEC-DTC, FLOPPY DISK DRIVES, COMPLETE CABINET ASSEMBLIES, FLOPPY DISKETTES, FLOPPY DISK DRIVE CABINETS

SERVICES AVAILABLE - COMPLETE HARD DRIVE AND FLOPPY DISK DRIVE REPAIRS. FAST TURN-A-ROUND

SOFTWARE SUPPORT, INC.

1 Edgell Road, Framingham, MA 01701 (617) 872-9090 Telex-383425

Hours: Mon. thru Fri. 9:30 am to 5:30 (E.S.T.) Sat. 10 am to 4:30 pm

DEALER INQUIRIES INVITED.

TERMS:
M.C./Visa/Amex and personal checks accepted at no extra charge.
C.O.D., please add $3.00.
Shipping: Please call for amount.
Not responsible for typographical errors.
Prices subject to change.

CANADA
MICRO R.G.S. INC.
751, CARRE VICTORIA, SUITE 403
MONTREAL, QUEBEC, CANADA, H2Y 2J3
Regular Tel. (514) 287-1563
Canadian Toll Free 800-361-5155

Service! Service!
All in stock products are shipped within 24 hours of order. Repair/Warranty service is performed within 24 hours of receipt unless otherwise noted. We accept C.O.D., foreign and APO orders. School and D&B corporate P.O.s accepted.

TRS/80 Registered Trademark Tandy Corp. Apple Registered Trademark Apple Computer Corp
IBM-PC Registered IBM Corp. Franklin Registered Trademark Franklin Corp. Max/80 Registered Trademark Lobo Int.
LDOS Reg. Logical System Inc. Dosplus - Micro Systems Software Newdos/80 - Apparat Inc.

DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES DISK DRIVES

CIRCLE 196 ON READER SERVICE CARD

Teachers Reach Out And Touch with PCs

Teachers and students learn to use The Source and telecompute with their peers in other high schools while participating in the IBM/ETS Secondary School Computer Education Program.

Telecommunications, an application currently receiving little attention from educators, can change the character of the traditional classroom by linking students with the outside world. Successful interaction is, after all, one of the primary goals of education.

Teachers and students at 89 secondary schools in three states recently had the opportunity to extend the boundaries of their classrooms with the help of modems and communications software—and to experience the pitfalls of educational telecommunications. They participated in the IBM/Educational Testing Service (ETS) Secondary School Computer Education Program (see "An IBM First for Secondary Schools," *PC*, Volume 3 Number 6, for a full description of the program).

The Setup

IBM donated approximately 1,500 PCs and a substantial amount of software, teacher training, and technical support to institutions in New York, California, and Florida. Participating institutions were organized into 12 clusters, each made up of five to nine schools and one teacher training institution (TTI) to train and support teachers from that cluster's schools.

The Source Telecomputing Corporation and Tymnet, Inc., agreed to donate a

total of 3,700 hours of prime-time usage of The Source information service and Tymnet's telecommunications network. In addition, Hayes Microcomputer Products, Inc., gave more than 100 Smartmodems and copies of its *Smartcom II* telecommunications software to participating schools. However, each school was responsible for installing phone lines and paying for their use.

The telecommunications activities of schools participating in the IBM/ETS program fell into two general categories: administrative and instructional. The most frequent administrative activity involved the use of The Source's electronic mail facility for exchanging program information. Through The Source, news concerning discounts on educational software, hardware problems and solutions, teaching ideas, and teaching resources was distributed. For instance, when a teacher's question about a *Peachtext* formatting command could not be answered through the manual or other technical support sources, a call for help was broadcast to all schools.

Instructional Uses

Teachers used the PC's telecommunications capabilities for three types of instructional applications: to encourage interaction among participants in different schools while providing a basic introduction to telecomputing, to gather and analyze information, and to teach the technical aspects of data communications. For example, at Hudson Senior High School, in Hudson, Florida, teachers and pupils set up a telecommunications word puzzle to be solved using The Source's electronic mail system. Each school received a different clue to the puzzle's solution. To gather additional clues, students contacted their peers in the schools taking part in the exercise.

Cooperative Learning

Business class students and teachers at Owego Free Academy in Owego, New York, and Tioga High School, in Tioga

Illustration: Carter Goodrich

Center, New York, participated in a cooperative learning project, which involved two programming teams, each made up of students from both schools. Members of each team exchanged the code they had written so that the pieces of the project could be integrated and tested as a single unit.

Students made good use of The Source for news gathering. For instance, at Chamberlain High School, in Tampa, Florida, instructors used The Source's financial information facilities to teach a course on the stock market to learning-disabled students. Students set up and followed three hypothetical stock portfolios, graphing weekly highs and lows and analyzing changes in relation to the Dow Jones Industrial Average.

To teach students about the technical aspects of communications, teachers at Santa Monica High School, in Santa Monica, California, worked with their classes to set up a local bulletin board. Students were responsible for developing ideas for new services and for rewriting the bulletin board program to incorporate these services. The board contained a calendar of school events, a message center for members of the school community and general public, and information on the uploading and downloading capability of the bulletin board project.

The Pitfalls

The integration of telecomputing into school life is not always smooth. For participants in the IBM/ETS program, the two most significant problems were obtaining necessary district approvals and difficult teaching conditions.

The incorporation of telecomputing into the schools entailed several approvals from administrators or their boards of education. Some administrators feared students would illegally tap into private data systems. To gain approval, some of the schools agreed to place the PCs in restricted areas, limiting computing activity to a select group of students.

Furthermore, the administrators responsible for approving the contract issued by The Source Telecomputing Corporation for use of its information utility felt that it was necessary to submit the contracts to their lawyers for a comprehensive review. While justified, such reviews—and the inevitable requests that follow for contract modifications—can cause substantial delays in bringing telecomputing into the classroom.

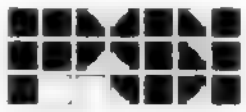
For telecomputing to be successfully

COMPUTER-AIDED ENGINEERING WITH YOUR PERSONAL COMPUTER

PSI/Systems has dozens of software packages that simplify complex engineering calculations in a wide range of applications. They run on IBM-compatible personal computers, desktop and portable, and they are **very** reasonably priced.

Whether you are an engineering/research professional, educator or student, you can save hundreds of hours of work or training time with PSI/Systems engineering software.

Call or write today for a free copy of the all-new catalog from PSI/Systems—the leading source of proprietary software, custom programming and systems design consulting in the dynamic world of computer-aided engineering.



PSI/Systems
A Division of Physical Sciences Inc.

Research Park, P.O. Box 3100, Andover, MA 01810
(617) 475-9030 Telex: 382903 Source: BCC875

CIRCLE 530 ON READER SERVICE CARD

CIRCLE 295 ON READER SERVICE CARD

integrated into the secondary school curriculum, teachers must have the proper support. Time was a precious commodity for the teachers participating in the IBM/ETS program. These teachers were responsible for organizing the donated equipment into a new computer lab, scheduling classes, developing lesson plans that incorporated the computer, and reviewing and learning how to operate new software. The added responsibility of learning the fundamentals of telecomputing was simply not practical for many of these individuals.

Instructor Attitudes

Some instructors participating in the program did not use telecommunications because they saw no immediate educational advantage to it. Instead of the financial, electronic mail, and other services offered by The Source, these teachers preferred to have access to CAI lessons, educational games, and databases directly relevant to English, history, math, and science. Other teachers saw little reason to invest time in learning to use telecommunications equipment because they feared that access to The Source and Tymnet would be cut off after the one-year period of the donation program ended. While the schools could keep the donated hardware and software, they would no longer have free access to the services of The Source and Tymnet.

> For telecomputing to be integrated into a school, teachers must have the proper support.

The obstacles to integration of telecommunications into the school routine can best be avoided by promptly securing administrative support, giving teachers the needed preparation time and an appreciation for the educational value of telecomputing, and keeping costs within the reach of the typical school system. The time and effort these measures entail are far outweighed by the benefits that telecommunications can bring to teachers and students. ■

Randy Elliot Bennett, an educational researcher, has published several articles and a book on the use of microcomputers in schools.

OVERCOME LIMITATIONS OF MS FORTRAN WITH

NO LIMIT FORTRAN

$59.00 Check/Visa/MC

Powerful Assembler subroutines transform MS FORTRAN into a flexible, responsive language for the microcomputer environment

- Extensive Graphics Commands (Including GET PUT PAINT)
- Full Screen Cursor Control
- Keyboard Input During Execution
- File Check, Rename, Delete
- Serial Port Control
- Peek and Poke

With NO LIMIT and MS FORTRAN, mainframe users can fully realize the advantages of micro-computing

M | E | F Environmental Inc.
9705 Burnet Road, Suite 311
Austin, Texas 78758
(512) 835-0848

MS-FORTRAN is a trademark of Microsoft, Inc
NO LIMIT FORTRAN is a trademark of MEF Environmental, Inc

CIRCLE 204 ON READER SERVICE CARD

Oh No!

Your only copy of vital data.

Lost. Gone.

It happens to us all.

The solution is *file recovery* with *The Norton Utilities*™

Oops protection.

A powerful set of programs which provide file recovery, disk exploration and more. Works with DOS 1.00 - 2.10, PC, XT, PCjr, Compaq, Compaq-plus and all full compatibles.

Data Insurance

File recovery
Disk exploration

Norton Utilities

And more!

Available from Computerland better software dealers, or order direct, for $80.

Peter Norton
2210 Wilshire Blvd.
Santa Monica, CA 90403

(213) 399-3948
Visa / MasterCard

CIRCLE 346 ON READER SERVICE CARD

COMPUTER DISCOUNT PRODUCTS

HUGE Inventories • IBM Specialists

★ ASK ABOUT OUR FAIR PRICE POLICY – *IT'S GUARANTEED!* ★

ADVENTURE & GAMES

BRODERBUND Apple Panic	21.99	MICROLAB Miner 20-49er	27.99
Loderunner	24.99	SIR-TECH Wizardry	44.99
Serpentine	26.99	SUBLOGIC Night Mission Pinball	32.99
SIERRA Crossfire	26.99	**MICROSOFT**	
Frogger	21.99	**Flight Simulator II**	**39.99**

INFOCOM™

TEXT ADVENTURE GAMES
CP/M Versions: $CALL

Cutthroats ***NEW***	27.99	Sorcerer	31.99
Deadline	34.99	Starcross Suspended	ea34.99
Enchanter	27.99	Witness	27.99
Infidel	31.99	Zork I	27.99
Planetfall Seastalker	ea27.99	Zork II-III	ea31.99

UTILITIES & ENHANCEMENTS

ALPHA Typefaces	79.99
CENTRAL POINT Copy II PC	25.99
NORTON Utilities	55.99
PC Crayon	49.99
SIDEWAYS	44.99

KOALA SPEED KEY
Touch Pad Enhancement 79.99

DISKETTES & STORAGE

Flip 'n File w/Locktray Holds 25	17.99
Flip 'n File w/Locktray Holds 50	27.99
Library Case	1.99
Media Mate 5¼" Holds 50	12.99
Media Mate 3½" Holds 50	11.99
Printer Stand-Large	29.99
Printer Stand-Small	24.99

	10	100
Dysan 5¼" SS/DD	31.99	299.99
Dysan 5¼" DS/DD	36.99	369.99
Maxell 5¼" SS/DD	27.99	259.99
Maxell 5¼" DS/DD	37.99	359.99
Memorex 3½" SS/DD	41.99	399.99
Memorex 5¼" SS/DD	19.99	189.99
Memorex 5¼" DS/DD	26.99	259.99

HARDWARE

AST I/O Plus	***$CALL***
Mega Plus II	289.99
Six Pack Plus	279.99
MODEMS Hayes 300 Baud	219.99
Hayes 1200 Smartmodem	495.99
Hayes 1200B Modem	439.99
Novation 103 Smart Cat	169.99
Novation 103/212 Auto Cat	399.99
NOVATION Access 1-2-3	439.99
Expansion Module	29.99
ORANGE MICRO Chipmunk	359.99
Mr. Chips-4 Functions	116.99
PLANTRONICS Color Plus	375.99
TITAN 64K Board	499.99

MicroPro

Chartstar ***NEW***	319.99
Infostar	259.99
Spellstar	139.99
TeleMerge ***NEW***	119.99
Wordstar	259.99
Wordstar Pro	369.99
Pro Options Pack	181.99

SPECIAL THIS MONTH

TAXAN

MONITOR

420 RGB **449.99**

Super High Resolution
Compact Design • Sharp Image

QUADRAM

Quad 512+ 64K	229.99
Quadboard Color II No K	219.99
Quadboard Color II 64K	269.99
Quadcolor I	205.99
Quadcolor Upgrade	209.99

MICROFAZER
All Configurations 149.99

APPLE PRODUCTS

COMPLETE PRODUCT LINES
AVAILABLE FOR APPLE!
Call For Pricing

BEAGLE Utilities Galore!	***$CALL***
BRODERBUND Print Shop	39.99
DLM Educate Home & School	***$CALL***
DAN PAYMAR Low Case 2 Rev 7	19.99
Lower Case 1 Rev 1-6	25.99
KENSINGTON System Saver	64.99
MOCKINGBOARD	109.99
NOVATION Applecat II 300Bd	249.99
ORANGE MICRO Grappler +	114.99
TAXAN 12" Monitor Amb 20mhz	139.99
TITAN Accelerator IIe	449.99
VIDEX Pre-Boots Assorted	***$CALL***

ACCESSORIES & PERIPHERALS

OTHER PRINTERS & MONITORS
– $CALL –

KENSINGTON PC Saver	29.99
KOALA Touch Pad	95.99
KRAFT Joystick	44.99
Paddles	31.99
MONITORS Amdek 310A	179.99
Princeton Hx-12	475.99
Princeton Max-12	189.99
Quadram Quadchrome RGB	529.99
Taxan 12" Amber #122	169.99
Taxan 12" Green #121	159.99
PRINTERS Epson FX80	499.99
Epson RX80	329.99
Okidata 92P w/Plug 'n Play	459.99
RIBBONS FX, MX, RX80	4.99
FX, MX, RX100	7.99
TG Joystick	39.99
Paddles	27.99
TEAC ½ Height Drive	179.99

APPLICATION SOFTWARE

FOR THE HOME

BRODERBUND Bank Street Writer	59.99
CONTINENTAL Home Accountant	84.99
Tax Advantage	49.99
MICRO COOKBOOK	31.99
MONOGRAM Dollars & $ense	119.99

FOR THE BUSINESS

ASHTON TATE dBASE III	474.99
Encyclopedia	59.99
Frame Work	474.99
Friday	184.99
CONTINENTAL Ultrafile	119.99
CROSSTALK	139.99
LIFETREE Volkswriter Deluxe	219.99
MICROSOFT Multiplan	165.99
Word	239.99
Word with Mouse	315.99
MULTIMATE	379.99
PFS File, Graph, Write	99.99
PFS Report	89.99

EDUCATIONAL

LEARNING COMPANY ***NEW***	
Addition Magician	26.99
Magic Spell/Word Spinner	ea27.99
Reader Rabbit/Moptown	ea31.99
PEACHTREE Algebra I	34.99
SCARBOROUGH Mastertype	34.99
SPINNAKER Alphabet Zoo	21.99
Hey Diddle Kindercomp	ea21.99
Delta Drawing	32.99
Facemaker/Fraction Fever	ea23.99
Most Amazing Thing	26.99
Snooper Troops I-II	ea29.99
Story Machine	23.99

KOALA
Muppet Learning Keys 59.99

MAIL AND PHONE ORDERS
Inquiries Welcome!
(408) 985-0400
MAIL, PHONE, WILL-CALL
SERVICE FROM 6AM (PST)

COMPUTER DISCOUNT PRODUCTS – SINCE 1977
860 So. Winchester Bl., San Jose, CA 95128
– CALL (408) 985-0400 –
Retail Showrooms In California
San Jose • San Mateo • San Francisco

- No Charge For Credit Cards
- Prices Subject To Change
- Software Sales Are Final
- International Orders Welcome
- Min. UPS Chg. $4 + Ins.
- Min. US Postal Chg. $10
- **P.O's Welcome – $CALL**

VISA · AMERICAN EXPRESS · MasterCard

CIRCLE 230 ON READER SERVICE CARD

Rating Managerial Skill

How good a manager are you? Thoughtware's new software aims to help you assess and improve your prowess. But management training is more than a matter of yes and no.

Thoughtware, Inc., produces software with an ambitious goal. By transplanting traditional management development training to the PC, its programs aim to help you change both "what you do and how you do it" to improve your management skills. The specific objective of *Assessing Personal Management Skills*, part of Thoughtware's Management Diagnostic Series, is to make you more aware of your managerial behavior.

Thoughtware eschews conventional menus for the thoughtree, a hierarchical map resembling an organizational chart. Thoughtree branches connect units of instruction through which you travel, by pressing the number of the unit you wish to study.

The thoughtree is a novel but slow and indirect method of organizing and accessing information. It spreads a menu that could fit on a single screen across eight displays, adding unnecessary searching and key-pressing to topic selection and browsing.

Exiting a unit deposits you at the top of the thoughtree rather than at a more convenient point such as the display on which you entered. As a result, moving between units that are adjacent on the screen means traversing the length of the entire thoughtree. If you stop work in the middle of a unit, you cannot return to the point where you stopped. And once you leave a unit, the information you've collected is lost.

Within each unit are questionnaires, typically several statements with numbered response scales reflecting agreement or disagreement. One example: "With all the things that middle managers in this organization have to do, it's unreasonable to expect them to spend much time developing the abilities of their subordinates." You respond to this statement by entering a number from 1 (strongly disagree) to 5 (strongly agree).

The program compares your responses to "norms," statistically analyzed scores of managers who have taken the same questionnaire. These comparisons are the basis for Thoughtware's assessments of your management behavior. You record your results on worksheets that include open-ended "thought" questions such as "How might you im-

Assessing Personal Management Skills
Thoughtware, Inc.
2699 South Bayshore Dr., Suite 1000A
Coconut Grove, FL 33133
(800) 848-9273
List Price: $350
Requires: 64K RAM, color adapter card.

CIRCLE 744 ON READER SERVICE CARD

Illustration: Kimberly Root

5 Year Warranty SPECIAL OFFER ON Verbatim. Datalife Diskettes

Preserving your data is vitally important. Lose it and you've lost both time and money. That's why Verbatim Datalife Diskettes have 6 data-shielding improvements for greater disk durability and longer life. They come standard with the 5 year warranty that's 5 times longer than the industry standard—it guarantees trouble-free recording, storage, and retrieval. And to help introduce you to the Verbatim quality standard we're running a special on many of their products, including—

Datalife and Verex Diskettes
Cleaning Kits • Disk Drive Analyzers

PLUS! Specials on many other products in our full range discount catalog of computer supplies. Call, write, or utilize reader service to obtain your FREE catalog with special offer coupon encosed.

LYBEN COMPUTER SYSTEMS
1250-E Rankin Dr. • Troy, MI 48083 • Phone (313) 589-3440

Simply #1 in service and reliability.

Datalife. The name is the promise. The warranty is the proof.

CIRCLE 194 ON READER SERVICE CARD

DISK MECHANIC T.M.

The ULTIMATE Backup, Analyze & Repair Utility
The Disk Toolkit NO IBM PC Should be Without
Protects Your Software Investment

BACKUP TOOLS:
- Can Backup Most Every Diskette
- SUCCEEDS where others fail!
- Works Manually or Automatically
- Create "Protected" Diskettes
- Many Additional Analysis Tools

SECTOR TOOLS:
- Examine/Print Sector Data
- Modify (ZAP) Sector Data
- Compare, Copy & Zero Sectors
- Search Sectors For Data

FILE TOOLS:
- Show Disk & File Allocation
- Display & Alter File Data
- Repair Damaged Disks
- Recover Erased Files
- Alter "Hidden" Status
- Search Files For Data

HACKER TOOLS:
- Modify Floppy Disk Controller Parameters
- Supports All FDC R/W Commands

DISK MECHANIC works with all standard IBM PC disk formats including "protected" diskettes with mixed track and sector sizes, blank and high track formatting, CRC errors, and single or double sided drives. DISK MECHANIC requires an IBM PC with 128K of memory or COMPAQ with 192K of memory, DOS 1.10, and 2 floppy disk drives. DISK MECHANIC includes a detailed 48 page instruction manual. To Order DISK MECHANIC send check or money order for $70 plus $3 for shipping (Mass. res. add sales tax.) to: MLI MICROSYSTEMS, Box 625, Framingham, Mass. 01701 or Call (617) 926-2055 for Mastercard or VISA orders. Dealer/Distributor inquiries welcome. ©1983 MLI MICROSYSTEMS.

MLI MICROSYSTEMS

CIRCLE 340 ON READER SERVICE CARD

Contemporary ComputerWear

DUST COVERS FOR THE IBM PC

Attire your IBM PC in style! **ComputerWear** is dust protection with class. Design features include select, woven fabric and embroidered emblem. Order now. Satisfaction guaranteed.

☐ **YES,** PROTECT MY PC IN STYLE! SEND ME: ☐ CHECK
____ Keyboard(s) $16 ____ Monitor(s) $18 ☐ VISA
____ Drive(s) $18 ____ Printer(s) $18 ☐ MC
____ 1pc Mon/Drive$36 Add $2.00 Shipping Total: $_____
(CA Res add tax)

Print Name: _____
Address: _____
City/State: _____ Zip_____
Credit Card #: _____ Exp._____
Signature: _____

Contemporary ComputerWear Att: EM
1320 36th Ave./San Francisco, CA 94122 • 415/564-0506
IBM PC is a trademark of International Business Machines Inc.

CIRCLE 121 ON READER SERVICE CARD

Buy and sell stocks with your personal computer.

Now use your own personal computer to place stock and option orders 24 hours a day, seven days a week. Get quotes, review your portfolios and more. And save up to 75% on brokerage commissions.* For more information, call toll free today: **1-800-544-6666.** In Mass. 1-800-523-1919.

*As compared with full-cost brokerage firms. Minimum commission is $30.00.

FIDELITY
INVESTORS EXPRESS

FIDELITY BROKERAGE SERVICES, INC. Member NYSE. SIPC.
KPP111384

CIRCLE 180 ON READER SERVICE CARD

prove your own ability to give constructive feedback? "

Talking Heads

One unit begins with a graphic of a woman's head. Her animated lips move as she asks, "How often have you observed employees working at cross purposes, or employees working in a great flurry of activity but without a clear sense of direction? " The talking head in the next display is a male manager who recites objectives, pausing for you to rate each as effective or ineffective by pressing *E* or *I*. Unfortunately, it's not until after this exercise ends that the program defines criteria for setting effective objectives.

Next you respond to statements on goals and objectives. One is clear and direct: "Do you establish measurable and realistic work targets and deadlines?" Others are ambiguous: "Do you adjust resources when performance measures show discrepancies?" What resources—air? water? salary? How much of a discrepancy and in which direction?

The assessment feedback following the questionnaire is prefaced by: "Please write down the following results on worksheet #8 and review the questions found there." Results are shown on a bar graph that compares your score to data that, according to the program, represent the responses of over 100,000 "people" from over 3,500 work groups. In one trial, the average score was 5.3; my score was 5.0. The program's assessment: "Your score was below the mean. You could probably benefit from some instruction. . . ."

Ambiguous Feedback

Thoughtware's approach to measuring attitudes is flawed, often through carelessness, making it difficult to draw useful conclusions. "Very poor score" and "very good score" are judgmental, suggesting pass/fail performance more appropriate to a test. Ratings and statistics can be intimidating, especially if not accompanied by information that puts them in perspective. The significance of a score that falls "below the mean" cannot be fairly judged without more information about the distribution of all scores.

On a survey about clarifying managerial responsibility, my score was 31, while the average score of 24,000 managers surveyed was 27. The explanation: "This means you define the scope of your responsibility in broad terms, which exceeds national norms. Too broad a scope of understanding of your role can result in diffuse or unfocused work performance." The program is fond of dropping the word "national," an adjective that lends authority to any noun. But the validity of a given conclusion depends on several factors, especially the number of studies on which it is based and the number and kinds of people studied. If you manage white-collar workers while managers in the control group oversee laborers, the comparison and hence your score are meaningless.

Language Arts

The assessment feedback is ambiguous also. It mentions the dangers of "too broad a scope" of role understanding, which can result in "diffuse or unfocused work performance." Does this mean I'm on the verge of losing my grip on my job? Is it a judgment, prediction, or fact? How should I react to it?

Another bothersome characteristic of the program is its language. Sentences strive to sound authentic and precise but end up pretentious and confusing: "Those who insist on the use of Thoughtware programs without experiencing one or more themselves, probably communicate shallowness."

Thoughtware claims that on the average, its Management Diagnostic Series "cuts the cost of staff development, in half by virtually eliminating instructor costs, the need for classroom facilities, and the cost of travel for trainer and trainee." Yet the realities of training resist cost-cutting more than Thoughtware thoughtlessly imagines. ■

MENU FOR YOUR EPSON

Now you can have full menu-based operation of all control functions of all of the Epson MX, FX and RX printers. **Printer Boss**™ software lets you send all of the complicated control codes, in seconds, by making menu selections with a few simple keystrokes.

Select and deselect pica, elite, compressed, italic, enlarged, emphasized, doublestrike, underline, superscript and subscript for scores of different type faces. **Set** line spacing, right and left margins and skip-over-perforation. **Load** USA, France, Germany, England, Denmark, Sweden, Italy, Spain and Japan language sets. **Control** unidirectional, half-speed and proportionally-spaced printing. **Store and retrieve** 10 complete menu settings with a few keystrokes. Create ASCII files of data, corresponding to the stored menu settings, which can be accessed by or included in your own programs to set up the printer as required. **Emulate** the IBM-label printer for the IBM-PC, eliminating printout problems with IBM-PC software and Epson FX printers. **Download** to FX printers five different **IBM character sets,** including graphics, screen and APL characters and greek symbols. Print two-pass **letter quality** on your FX at **full text-mode speed,** up to 10 times faster than with programs using graphics mode. Print multi-page **spreadsheets** as wide as you like, **sideways** on your paper, in a choice of five different type sizes. Or create a **printer buffer** of up to 32K. Ideal for **IBM graphics** software, or **screen dumps,** or printing text from **Wordstar, Lotus 123** or many other fine programs.

Printer Boss™ for the IBM-PC and compatibles $59.95. With Letter Boss™ letter quality or Sidekick™ sideways print option $99.95. With both $139.95. Visa, MC, or send check. Free info. Dealers welcome.

Printer Boss™

CONNECTICUT SOFTWARE
30 WILSON AVENUE
ROWAYTON CT 06853
203-838-1844

SIDEKICK IS NOT TO BE CONFUSED WITH SIDEWAYS, A TRADEMARK OF FUNK SOFTWARE PRINTER BOSS LETTER BOSS AND SIDEKICK ARE TRADEMARKS OF SPEER RESEARCH CORPORATION WORDSTAR AND LOTUS 123 ARE TRADEMARKS OF MICROPRO INT'L CORP AND LOTUS DEVELOPMENT CORP RESPECTIVELY

CIRCLE 317 ON READER SERVICE CARD

micro STOREHOUSE

333 Peters Street, S.W./Atlanta, Georgia 30313/404-233-0000

HARDWARE

COMMUNICATIONS

WE CARRY IRMA BOARDS AND A VARIETY OF NETWORKING ALTERNATIVES. CALL FOR INFORMATION.

DISK DRIVES

AMDEK IBM COMPATIBLE ½ HEIGHT. . . . . .
GREAT LAKES 10MEG, 23MEG, & 40MEG. . . . . .
IOMEGA BERNOULLI BOX. . .
TANDON TM 100-2. . . . . .

MODEMS

HAYES 300, 1200, 1200B. . . .

MONITORS

AMDEK MOST MODELS. . . .
COMREX 5400A & 5400G. . .
PGS HX-12. . . . . .
QUADRAM QUADCHROME. .
NOTE: THE PRINCETON HX-12 AND QUADRAM QUADCHROME ARE IDENTICAL.
ZENITH ZVM 133. . . . . .

MONITOR ADAPTERS

AMDEK MAI BOARD. . . . . .
HERCULES COLOR & MONOCHROME. . . . . .
QUADRAM QUADCOLOR I & II. .
TECMAR GRAPHICS MASTER. .

**OTHER BRANDS AVAILABLE, PLEASE INQUIRE.

MULTIFUNCTION BOARDS

QUADRAM MOST MODELS. .
TECMAR CAPTAIN. . . . . .
**OTHER BRANDS AVAILABLE, PLEASE INQUIRE.

PRINTERS

BROTHER HR-15 & HR-25. .
CANON COLOR INK JET. . . .
COMREX CR II & CR III. . . .
NOTE: BROTHER AND COMREX PRINTERS ARE VIRTUALLY IDENTICAL.
DIABLO 630 API & 630 ECS. . .
EPSON ALL MODELS. . . . . .
NEC 3550. . . . . .
OKIDATA 92, 93, & 84. . . . .
NOTE: WE CARRY TRACTOR FEEDERS AND CUT SHEET FEEDERS FOR MOST OF THE PRINTERS WE SELL.

MISCELLANEOUS ACCESSORIES

EPD LEMON, LIME, ORANGE, & PEACH. . . . . .
KAOLA PADS. . . . . .
KRAFT JOYSTICKS & GAME PADDLES. . . . . .
MICROSOFT MOUSE. . . . . .
NETWORX POWER & MODEM PROTECTORS. . . . . .
QUADRAM MICROFAZERS. .

SOFTWARE

BUSINESS SOFTWARE

ARMOUR SYSTEMS EXCALIBUR. . . . . .
BPI GENERAL ACCOUNTING. . .
DOW JONES SOFTWARE. . . .
HARVARD PROJECT MANAGER. . . . . .
IUS BUSINESS SERIES. . . . .
MICROSOFT PROJECT. . . . .
PRACTICAL ACCOUNTANT. . .
SAM'S FINANCIAL PLANNING. .
THINK TANK. . . . . .
XQ SOFTWARE. . . . . .

COMMUNICATIONS

CROSSTALK XVI. . . . . .
HAYES SMARTCOM II. . . . .

DATA BASES

EASY FILER. . . . . .
INFOSCOPE. . . . . .
INFOSTAR PLUS. . . . . .
KNOWLEDGEMAN. . . . . .
PFS FILE & REPORT. . . . . .
POWERBASE. . . . . .
RBASE 4000, CLOUT, PROGRAM INTERFACE, & EXTENDED REPORT WRITER. . . . . .

Announcing

Daily Price Up-Dates!

Call

1-800-554-7661

and order at today's lowest possible price. Any product shown here (and many we can't advertise) will be available at the most competitive price possible.

micro STOREHOUSE

333 Peters Street, S.W./Atlanta, Georgia 30313/404-233-0000

INTEGRATED PACKAGES
DAYFLO. . . . . .
IUS EASY PRO. . . . . .
OPEN ACCESS. . . . . .
VISION. . . . . .

GRAPHICS
BPS BUSINESS GRAPHICS. . .
CHARTSTAR. . . . . .
CHARTMASTER. . . . . .
GRAPHWRITER. . . . . .
PC-DRAW. . . . . .
PFS GRAPH. . . . . .
SIGNMASTER. . . . . .
SNAPSHOT. . . . . .

PROGRAMMING
LATTICE C & UTILITIES. . . . .
MICROSOFT COMPILERS. . .
MORGAN PROFESSIONAL BASIC. . . . . .
SCREEN MANAGER FOR C AND PASCAL. . . . . .
VEDIT TEXT EDITOR. . . . . .
**OTHER BRANDS AVAILABLE, PLEASE INQUIRE.

SPREADSHEETS
MULTIPLAN. . . . . .
MULTI-TOOL BUDGET. . . . .
MULTI-TOOL FINANCIAL STATEMENT. . . . . .
SUPERCALC 3. . . . . .
VISICALC. . . . . .
**OTHER BRANDS AVAILABLE, PLEASE INQUIRE.

TRAINING
ATI MOST PACKAGES. . . . . .
CBS MASTERING THE COLLEGE BOARDS. . . . . .
CBS MASTERING THE SAT. .
MASTERTYPE. . . . . .
PC TUTOR. . . . . .

UTILITIES
MULTILINK. . . . . .
NORTON UTILITIES. . . . . .
PEEKS & POKES. . . . . .
PROKEY. . . . . .
SET-FX+. . . . . .
SIDEWAYS. . . . . .
THE INSIDE TRACK. . . . . .
WATCHDOG. . . . . .

WORD PROCESSING
EASY WRITER II SYSTEM
MICROSOFT WORD W/ OR W/O MOUSE. . . . . .
MULTIMATE. . . . . .
MULTIMERGE: CONVERTS DATA BASE FILES TO MULTIMATE MERGE FILES . . . . . .
PFS WRITE. . . . . .
VISIWORD PLUS. . . . . .
VOLKSWRITER DELUXE. . . .
WORDPERFECT. . . . . .
WORDSTAR. . . . . .
**OTHER BRANDS AVAILABLE, PLEASE INQUIRE.

Micro Storehouse has built an enviable reputation in the past year. We promised the best hardware, software, peripherals, accessories and supplies quickly at the most competitive prices and that's exactly what we've delivered to the IBM PC and compatible market.

In keeping with our policy, we now announce a revolutionary innovation: **DAILY PRICE UP-DATES!** To overcome the months of lead time required for advertising, we have decided to eliminate prices from our ads so that **you will be able to order from us at the lowest possible price on the day you call.**

Call Micro Storehouse toll free and get today's lowest price TODAY!

We will continue to accept Visa, MasterCard and American Express at no extra charge to you.

Shipping costs are unchanged: the exact cost of shipping plus $2.00 for handling and processing.

LARGE QUANTITY, CORPORATE ORDERS NEED SPECIAL ATTENTION.
Ask for a Corporate Account Representative if you're ordering multiples of any product. Your volume orders will be followed throughout the shipping and billing process to assure your corporation's total satisfaction.

For orders, call toll free:

1-800-554-7661

For information and compatibility questions, call 404-233-0000 and ask for our user friendly sales staff.
Prices subject to change without notice.

CIRCLE 422 ON READER SERVICE CARD

How thousands of people like you have saved countless hours learning to use the IBM® PC.

You can learn on your own computer at your own pace in hours instead of days for under $70.

Cdex™ Sudden Knowledge™ Training Programs turn your personal computer into your personal tutor. The following programs are available to train you on how to effectively utilize your IBM PC.

How to use Your IBM PC or PC/XT® with PC-DOS®

- IBM PC Hardware and Software Components
- The IBM PC Keyboard
- DOS Commands
- Special XT Features

Training for IBM PC-DOS

- DOS 2.0 and 2.1 Structure
- Advanced DOS Commands
- Using Tree Structured Directories
- Using DOS with the Hard Disk System

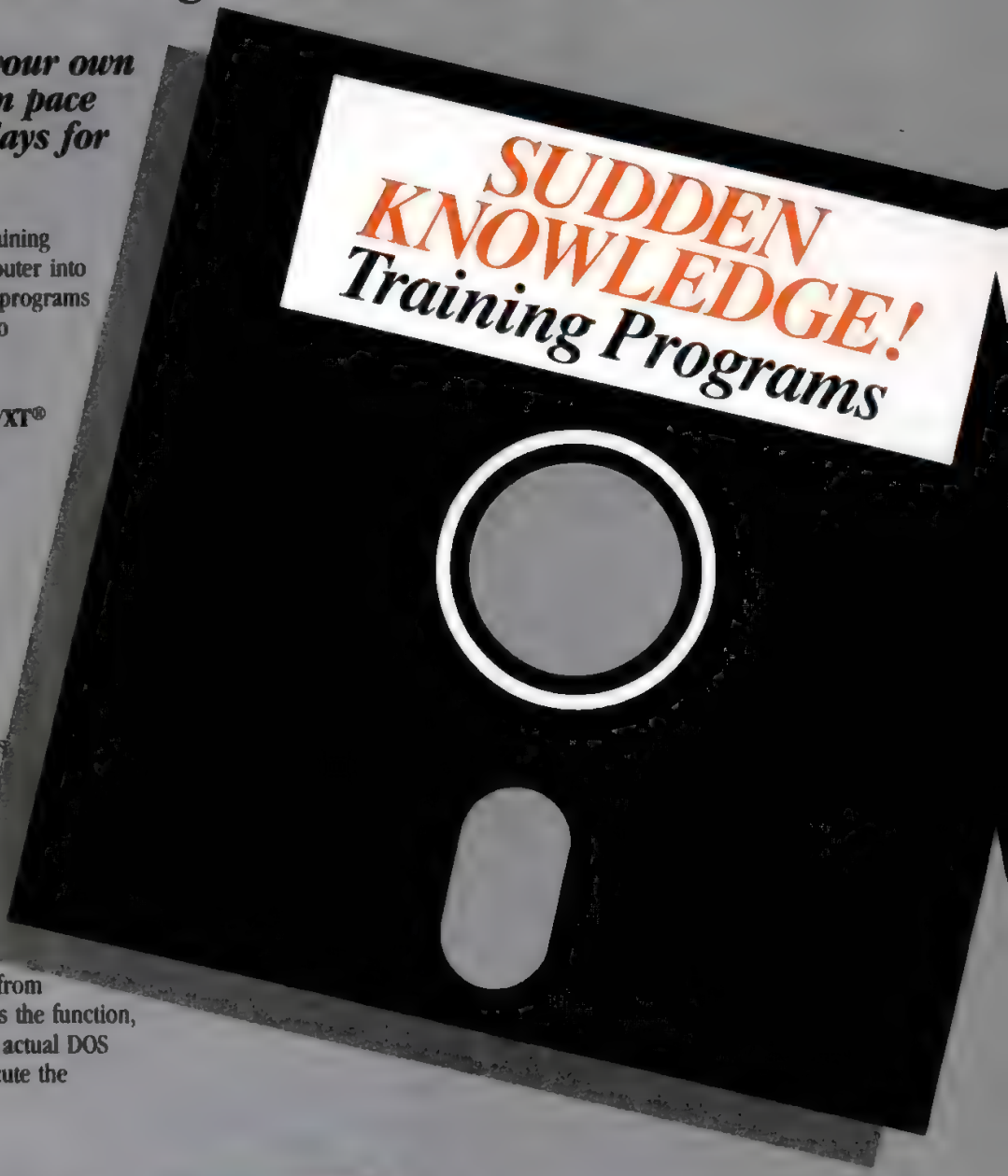
PC DOS Director™

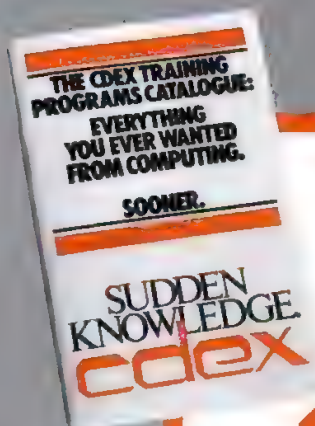
A menu-driven command directory that provides an English language interface to PC DOS. As you select individual functions from the menu, PC DOS Director defines the function, and on your command, issues the actual DOS command to DOS in order to execute the function.

PC Expert™

This program combines the three essential programs described above. You get "How to Use Your IBM PC or PC/XT with PC DOS," Training for PC DOS, and PC DOS Director, all for a reduced price.

Cdex offers over 30 programs to learn *how to use* and *how to apply* the most popular personal computers and personal computer software. Most programs run on the IBM PC, PC/XT or PCjr., the Apple® II family and TI Professional computers. Sudden Knowledge Training Programs are available nationally at most retail computer stores.





Call or write for our free catalogue of training products today. Call 800-632-7979 inside California; 800-227-6703 outside California.

cdex

Cdex Corporation, 5050 El Camino Real, Los Altos, CA 94022

Trademarks: Cdex, Sudden Knowledge, PC DOS Director, PC Expert, Cdex Corporation
Registered Trademarks: IBM, PC, XT, PCjr, PC DOS: International Business Machines, Inc.
Apple: Apple Computer Corporation

CIRCLE 111 ON READER SERVICE CARD

New On The Market

HARDWARE

IHR Graphics Controller

A high-resolution graphics controller board incorporating its own 8088 microprocessor and a VLSI NEC 7220 graphics controller chip. These on-board IC chips permit the board to run complex graphics applications at resolutions of 1,024 × 1,024 dots without taxing the addressable screen memory in the user's system.

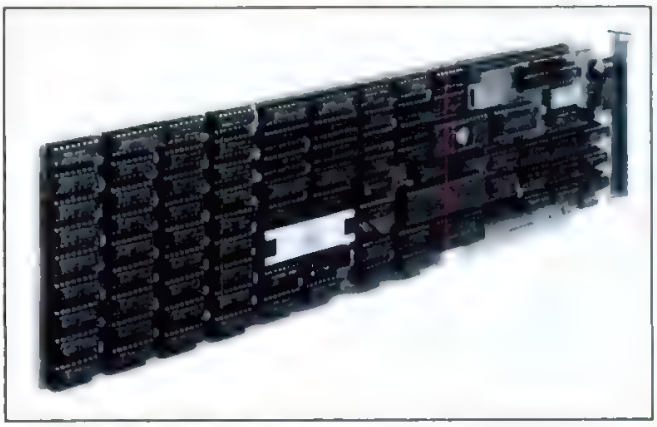
The controller is available in several configurations. The minimal configuration provides 1,024- by 1,024-dot resolution with two planes of memory (for four colors). Second and third planes of memory can be added to this configuration (for a maximum on-board memory total of 512K), allowing the simultaneous use of up to 16 colors. Finally, a color look-up table can be added allowing the user to choose 16 colors from a displayed palette of 4,096.

The board is compatible with software from DOS, BASIC, or BASICA, and includes C language routines for the NEC 7220. Other features include the ability to produce multiple windows under software control, with multiple screens held in on-board memory; external synchronization input; a light pen interface and standard RGB output; controllable pan, zoom, and scrolling; as well as hardware-based routines for drawing vectors, circles, arcs, rectangles, area fills, and graphics characters.

The board's display memory is not mapped, so it will not conflict with memory boards installed in the user's system. Up to two fully configured IHR Graphics Controller boards can be installed in the same system.

(List Price: Basic configuration, $1,295)
Frontier Technologies Corp.
P.O. Box 11238
3510 N. Oakland Ave.
Milwaukee, WI 53211
(414) 964-8689

CIRCLE 750 ON READER SERVICE CARD



***IHR Graphics Controller**, Frontier Technologies Corp.*

***Data Sentry**, Lockheed-Georgia Co.*

Data Sentry

An intelligent external modem capable of keeping a user's data secure without resorting to encryption algorithms or changes in systems programming. Used with an optional companion device called Remote-ON, the modem can also turn the user's system on from a remote terminal once security has been cleared.

In normal use, the modem's security routine requests the phone number of the caller. Then it hangs up and looks through its stored directory of authorized numbers. If the caller's number appears in the directory, the unit calls the number back and requests a password.

The caller gets three tries to give Data Sentry the right password. Without it, Data Sentry won't return further calls from that phone number. The modem automatically logs calls coming in with phone number, whether the calls were successful or not.

A lower security mode is also included, which lets users program the device to call back any number from which it gets the correct password. Alternatively, the user can choose to allow access to a system upon entry of only the correct password.

(List Price: $895; Remote-ON option, $145)
Lockheed-Georgia Co.
Marietta, GA 30063
(404) 951-0878
(404) 424-2701

CIRCLE 752 ON READER SERVICE CARD

CTS 212AH Modem

A Hayes-compatible standalone modem offering full-duplex, 300/1,200-bps operation. The CTS 212AH can operate in asynchronous communications mode at either 300 or 1,200 bps, and in synchronous mode at 1,200 bps.

The unit supports keyboard diagnostics including local or remote analog or digital loopback tests. Other features include adaptive dialing, DTMF tone or pulse dialing, auto-answer with speed detection, call-progress monitoring, auto-redial, and two RJ-11 jacks for both voice and data communications.

(List Price: $495)
CTS Corp.
131 West St.
Danbury, CT 06810
(203) 743-3681

CIRCLE 764 ON READER SERVICE CARD

Sola 1KVA UPS

An uninterruptible power supply built with two internal power supplies for continuous line power and battery charging. In the event of a sudden total power blackout, the unit can supply up to 1,000 volts AC for up to 12 minutes from its internal rechargeable lead-calcium battery, or up to 27 minutes with a separate, add-on battery pack.

The Sola 1KVA, available in both 50-Hz and 60-Hz models, incorporates a full-wave diode bridge to power its inverter circuitry and a linear, current-limited series-pass regulator to keep its internal battery recharged. This combination of supplies helps reduce the input power requirements 10 to 15 percent under other UPS devices in its class. The lower power requirements, coupled with reduced noise factors, results in more economical operating costs for the user.

Featuring a transistor-switching multiple pulse width inverter, the UPS holds output voltage within ±3 percent of nominal despite line voltage fluctuations of +10/-15 percent. The AC input circuit breaker, battery breaker, and inverter on/off switch are located on the unit's front panel. LED indicators and an audible alarm provide information on the unit's operating status at all times.

The battery pack is a sealed, 36-cell lead-calcium unit that supports 12 minutes of power at the rated level. A second battery pack can be added by the user to increase reserve power to 27 minutes. When line power is restored, the battery packs are automatically recharged as normal UPS output resumes.

(List Price: $2,955; 12-minute battery, $540; two batteries, $1,088)
Sola Electric
1717 Busse Rd.
Elk Grove Village, IL 60007
(312) 439-2800
(312) 228-1250

CIRCLE 772 ON READER SERVICE CARD

CTS 212AH Modem, CTS Corp.

VC-100-1 Color Monitor

A 16-color display monitor offering a dot pitch of 0.38 mm (compared to the IBM standard of 0.42 mm), resulting in sharper screen images. The 12-inch monitor can display 16 colors simultaneously, including such difficult-to-achieve colors as true brown, gray, and yellow. Colors hold their brilliance even at low-intensity settings.

(List Price: $595)
Vidstar
2114 Ringwood Ave.
San Jose, CA 95131
(408) 946-4036

CIRCLE 773 ON READER SERVICE CARD

Omega Diskless Memory Board

A multifunction board consisting of a main RAM board, capable of holding up to 1 megabyte of 256K chips, to which the user can add optional piggyback boards. The piggyback boards include such features as error checking and correction (ECC), serial and parallel ports, a clock/calendar, and a coprocessing module based on an Intel 80186 microprocessor.

The Omega Diskless Memory Board can be configured with either 64K or 256K RAM chips. With the 64K chips, the board can support a total of 256K RAM; the 256K chips allow the board a maximum of 1 megabyte. Included is an exclusive memory-mapping facility, allowing the user to easily establish the direct-addressable memory of the PC to its limit of 640K merely by setting the upper- and lower-limit switches. The remaining memory can be used as

RAMdisks through user-established port addresses. This allows the board to be used with existing RAM in the user's system. Up to 16 Omega Diskless Memory Boards can be installed in a single system through an expansion chassis.

An optional plug-on board allows the main board to incorporate error checking and correction features, with the capability of logging all errors found. This feature, normally found on mainframe systems, is crucial in those applications where data integrity is paramount.

The optional coprocessing module raises the throughput speed of the PC by a factor of up to four times average speed, using a true 16-bit 80186 microprocessor. Other coprocessor modules, built around a range of microprocessor chips, will be available in the future.

Each Omega Diskless Memory Board includes a disk with a program for setting and accessing the clock/calendar module, as well as an electronic drive and spooling program.
(List Price: With 256K RAM, $995)
Mega-Omega Systems Inc.
5477 Glen Lakes Dr., #108
Dallas, TX 75231
(214) 987-1340

CIRCLE 775 ON READER SERVICE CARD

***SOFDEX**, Colorado Computer Classics*

SOFTWARE

SOFDEX

A file management program that creates a master index, labels, and descriptions of all files stored on diskettes. *SOFDEX*'s master file provides a 40-character field for describing what is in a file, matching the descriptions with the computer directory of filenames.

A built-in text editor allows the user to keep the master file current, to print labels for diskettes, and to generate a hardcopy directory. *SOFDEX* also incorporates the ability to produce indexed Rolodex-type file cards, 3 by 5 cards, and manila folder labels.

The software does not include a printed manual. Instead, on-screen ASCII graphics guide the user through the program's features and use. Also included with the package is *The Oxford Guide to Filing Efficiency*, a text on establishing efficient filing systems.
(List Price: $94.75)
Requires: 128K RAM, one drive, PC-DOS 2.0.
Colorado Computer Classics
800 Hayden
Longmont, CO 80501
(800) 835-2446
(303) 772-2782

CIRCLE 747 ON READER SERVICE CARD

PC-OrgChart

A program to produce organization charts. The menu-driven software can accept changes in personnel or chart structure, automatically producing a revised chart.
(List Price: $95)
Requires: 128K RAM, one disk drive, PC-DOS, Epson printer with Graftrax.
Norfolk Systems
8 N. Fork Rd.
Laurel Springs, NJ 08021
(609) 783-4483

CIRCLE 768 ON READER SERVICE CARD

Lettrix

A utility that prints characters on Epson, Gemini, or Riteman printers in a 24 × 16 dot matrix instead of the usual 9 × 9 matrix. This provides letter quality results from these inexpensive printers.

Lettrix stays in 32K of the system's memory while other software is in the foreground, activating as needed for printing. The user may choose up to six fonts within a single document from a range of twelve supplied. Each typeface can be compressed, expanded, doubled in height, boldfaced, continuously underlined, and italicized. Written in C and assembly language, it recognizes and uses the print commands of the user's own software.
(List Price: $98.50)
Requires: 128K RAM, one drive, PC-DOS 2.x.
Hammerlab
7301 Yale Station
New Haven, CT 06520
(203) 787-5884

CIRCLE 763 ON READER SERVICE CARD

Softerm PC

A communications program that can function either alone or as an extension to PC-DOS, allowing the user to access its communications features from other programs. *Softerm PC* includes emulations of 24 popular terminals in addition to basic TTY terminal emulation. Features include keyboard macros, a built-in phone book for automatic dialing, and simultaneous capture of data to print or disk.

The software allows concurrent communications to be added to such programs as Lotus's *1-2-3*, *dBASE II*, *WordStar*, and other PC software. With a single keystroke, the user can interrupt the program in use to activate *Softerm PC*'s features. If the user resumes working in the original program, *Softerm PC* will perform its designated tasks concurrently as a background operation.

Up to four communications ports and three printer ports can be supported through background processing queues. In its various terminal emulation modes, both conversational and block transfer communications are possible, with on-line help screens provided for keyboard definitions.

Softerm PC also provides file transfer capabilities, including support for the XMODEM protocol. Also included is the *Softrans* protocol, providing CRC-16 error checking and data compression. A flexible command language allows interactive execution of file tranfers or automatic execution of command files. Command files can also be queued to a port for background execution, allowing concurrent operation of file transfers with other programs in the foreground.

Softerm PC, Softronics

(List Price: $295)
Requires: 128K RAM, one disk drive, PC-DOS 2.0, asynchronous communications adapter.
Softronics
3639 New Getwell, #10
Memphis, TN 38118
(901) 683-6850

CIRCLE 774 ON READER SERVICE CARD

Market Link

A program permitting the user to access either the Dow Jones News/Retrieval Service or The Source commercial databases with single keystrokes to obtain investment data.

Additionally, the user can define up to 27 security symbols for automatic retrieval of quote information from the Dow Jones database. Quotes can be accessed in unattended operation at up to six user-defined times. Data so obtained are automatically stored to disk for later analysis.
(List Price: $59.95)
Requires: 128K RAM, one disk drive, PC-DOS, Hayes-compatible modem, authorized access to the Dow Jones News/Retrieval or The Source services.
Smith-Micro Software, Inc.
P.O. Box 7137
Huntington Beach, CA 92615
(714) 964-0412

CIRCLE 760 ON READER SERVICE CARD

Basics of BASIC

A self-contained series of disk tutorials teaching the fundamentals of BASIC programming. *Basics of BASIC*, on two diskettes, contains 12 lessons designed to eliminate the need to refer to printed manuals, although a manual is included with reviews of each disk lesson, as well as additional practice material that tests content understanding.
(List Price: $99)
Requires: 64K RAM, one disk drive, PC-DOS.
Focus Media, Inc.
839 Stewart Ave.
Garden City, NY 11530
(516) 794-8900

CIRCLE 749 READER SERVICE CARD

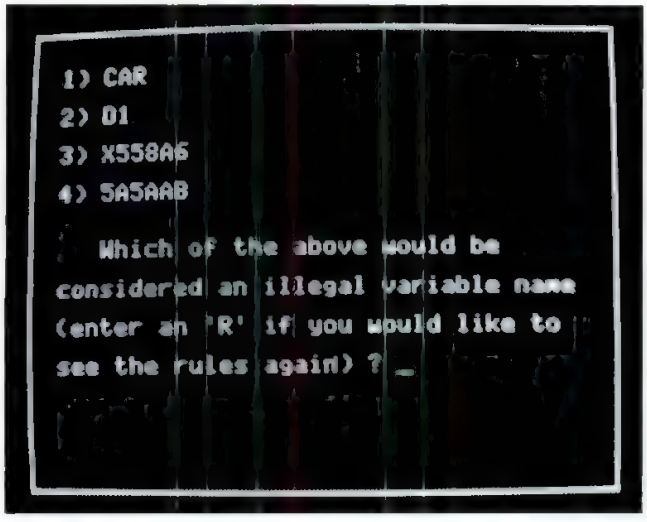
Freestyle

An outline-based word processing system with line-drawing capability. Additionally, *Freestyle* has integrated spelling checkers, a mail list merger, a Wang-like glossary feature called Keyfiles, and an on-screen interactive tutorial. It can also make use of all IBM special character sets (such as Greek and other foreign languages, engineering, and math characters) with on-screen text enhancement and horizontal scrolling.

The software's Outline Zoom feature provides the user with an interactive relationship between an outline and the corresponding document. Changes to the outline are instantly reflected in the document and vice versa. For example, sections of text can be rearranged and reorganized simply by moving headings in the outline. This feature also allows documents to be outlined, with directions for the actual creation of the document stored in an Outline Reference file. The outline and its reference file can then be used as templates for future document preparation.

The Draw feature allows the user to create forms, Gantt charts, process diagrams, and organization charts without a separate graphics program in most applications. The Keyfiles feature allows documents to be assembled from previously created boilerplate text or format command files with a single keystroke.
(List Price: $295)
Requires: 192K RAM, one disk drive, PC-DOS.
Select Information Systems
Sir Francis Drake Blvd.
Kentfield, CA 94904
(415) 459-4003

CIRCLE 755 ON READER SERVICE CARD



Basics of BASIC, Focus Media, Inc.

The Impersonator

A communications program that can emulate virtually any asynchronous terminal and automatically "learn" network log on/off protocols. Designed to satisfy the needs of users at any level of computer experience, *The Impersonator* provides functions that range from a simple typewriter mode, in which the printer is enslaved to the user's keyboard, to a built-in programming language for automating complex sequences of multiple data transmissions.

The Impersonator is preprogrammed with emulations of the Lear Siegler ADM-3A, DEC VT-52 and VT-100, Hazeltine Esprit, IBM 3101, Data General D210, and the Televideo 912 terminals. It also provides simple teletype emulation. To further customize the program beyond simply emulating a specific terminal, and to configure the software to emulate additional terminals, the built-in programming aids include over 60 pages of help screens. These help screens provide context-sensitive information as needed at each stage of the software's use.

Features of the program also include auto-dialing, unattended file transferring, and the ability to redefine the output of any key. This last feature allows keyboard conformity with any async terminal protocol and the emulation of certain functions. The feature also allows the user to manually enter log-in procedures once, after which the software will perform the function with a single keystroke.
(List Price: $195)
Requires: 192K RAM, one disk drive, PC-DOS.
Direct.aid, Inc.
P.O. Box 4420
Boulder, CO 80306
(303) 442-8080

CIRCLE 758 ON READER SERVICE CARD

FREE DATABASE

MANAGEMENT SYSTEM *

With Accounting, Payroll, Inventory & A/R Applications

PROGRAMMABLE RELATIONAL FULL VERSION NOT A DEMO

- Form Generator
- Subrecords
- Numeric Ranges
- Subtotals
- Manual is on disk
- Written in Basic for easy modification
- Over 15 000 Lines of Source Code Given
- Recommended by FRED BLECHMAN in his new book
- Report Generator
- Customizable Screens
- ASCII Output
- Tax Tables
- Creates Subfiles
- Sort on 3 Fields
- Recalculate Files
- 3 Files Open Simultaneously
- 14 Ways to Calculate Fields
- Transfer Data between Files
- Global Field Changes
- Key strings to numbers
- Real time transfers between files
- Retrieve on conditions for each field
- A user supported program
- Much More

AND SPREADSHEET

PROGRAMMABLE FULL VERSION NOT A DEMO

- With Sample Checkbook & Income Tax Applications
- Numbers & Text may be placed anywhere on the screens
- Automatic Recalculation
- 21 ways to calculate numbers or write your own subroutines
- Written in basic for easy modification
- Compiled Version Provided (192K)
- Source Code Given
- Graphics: Bar Charts
- Full Cursor Control

SUPERIOR IN SEVERAL AREAS

You get the source code in Basic. We wrote the program in Basic because most users, like you, already know how to program in Basic. Why waste your time learning an inferior one package "language" like Fred or Magnus? With the source code you can modify the system to do anything that can be done in Basic.
You do not have to be a software engineer to use the system. The entire system is menu driven. You do not have to learn hundreds of commands. You do not have to keep reading the manual since all the options are displayed on the screen.
If you write any application programs in basic you can reduce your programming time by 50% or more. You probably waste 50% to 80% of your time coding the inputting of data, storage of the data in files, retrieval of data, correction of data, screen design and other repetitious tasks. By using the database or spreadsheet to handle your repetitious tasks you will reduce your programming time by 80% or more. There are no royalties on applications.

- for IBM PC or XT with 128K
- Compatibles with 192K & Microsoft Basic
- PC Jr with 128K & Cartridge Basic
- Mail Today

PPE

POTOMAC PACIFIC ENGINEERING INC.
Box 2027 Gaithersburg, MD 20879 (301) 977 1486

* • Copy the system from someone who already has one OR
• For the latest most powerful edition send $15 to cover the costs of 3 DSDD disks 1st class mail, envelope, copying & handling
• Available on 8 SSDD disks, $5 extra
• Outside USA add $2, MD residents add 5% tax

Please send the Database & Spreadsheet to

Name _____

Street _____

City/State/Zip _____

Copies everything

personal Copier™

Our monthly trade-in plan *guarantees* you can *always copy everything!*

Personal Copier makes sure you're always up-to-date with the new and everchanging protection methods. You won't find an easier system. It's fully automatic, with easy-to-use two-step graphic screen instructions. Anyone can use it . . . every IBM PC user should have one. Order your Personal Copier today. $39.95 plus $3.00 shipping and handling

personal Copier™ from DISK-TECH

P.O. Box 162 · Wasco, IL 60183

MasterCard 312/365-2803 VISA

CIRCLE 164 ON READER SERVICE CARD

Now For IBM PC!

MCBA Mini-Computer Software For Distributors and Manufacturers

—A FULLY INTEGRATED ACCOUNTING AND DISTRIBUTION MANAGEMENT SYSTEM

- *RM COBOL*
- *SOURCE CODE AVAILABLE*
- *FIELD TESTED — 8 YRS.*
- *UP TO 9 INTERACTIVE MODULES*
- *G/L, A/R, A/P, PR, I/M, C.O.P., P/O B.O.M.P., J/C*
- *Dealerships and Consultant Arrangements Available*

Macola, Incorporated

181 S. Main Street Marion, Ohio 43302

(614) 382-5991

MCBA is a Registered Trademark of Mini-Computer Business Applications

CIRCLE 263 ON READER SERVICE CARD

IBM PC / VT100

EM100
for
IBM PC, XT, PORTABLE and COMPAQ.
also
APRICOT and VICTOR 9000.

VT102 emulation, English setup menus, 110-9600 BAUD, ASCII file transfer, Modem 7 compatible binary transfer, 132 columns on monochrome or color adapters, soft keys, Mass-11 Greek characters, Keytronics keyboard support, programmable scroll rate & more. Optional Tecktronix 4010/4014 emulation.

$175.00 single copy,
Multicopy discounts,
Site and Corporate Licenses.

DCS *Diversified Computer Systems*
100 Arapahoe Rd. (303) 447-9251
Boulder, CO 80306

Dealer inquiries invited.

Trademarks VT100 Digital Equipment IBM PC XT IBM Corp VICTOR 9000 Victor Technologies COMPAQ COMPAQ Computers Inc

CIRCLE 166 ON READER SERVICE CARD

Fast XT Backup

Save 60-90 minutes per week. DataCare™ backs a full hard disk to diskettes with verification in just 22 minutes.

Don't be letdown by Backup. DOS' Backup skips large block of data after soft disk errors and doesn't tell you. DataCare tries much harder. It is totally accurate or it lets you know.

Easy. Menu driven or can be invoked exactly like Backup and Restore. Performs all functions of Backup, Restore, and more. Runs under DOS 2.0/up.

30 day no risk. Your money back if you're not fully satisfied.

DataCare $129

Visa/MC

ELLICOTT SOFTWARE, INC.

3777 Plum Hill Court
Ellicott City, Maryland 21043
(301) 465-2690

DataCare is a trademark of Ellicott Software, Inc.

CIRCLE 175 ON READER SERVICE CARD

FREE SHIPPING "DISKETTES"

West Coast "Call" 1(800) 621-6221
Central & East "Call" 1(800) 654-4058

Discounts Starting at 3 Box Quantities

3M	Dysan	maxell	Verbatim
• 5¼" •	• 5¼" •	3½" CALL	• 5¼" Datalife
s-side d-den. 17.95	s-side d-den. 22.95	• 5¼" •	s-side d-den. 18.95
d-side d-den. 23.95	d-side d-den. 30.50	s-side d-den. 19.95	d-side d-den. 24.95
s-side quad 27.50	s-side quad 34.50	d-side d-den. 25.95	s-side quad 30.95
d-side quad 33.95	d-side quad 45.50	s-side quad 28.95	d-side quad 39.95
• 8" •	• 8" •	d-side quad 36.95	• 8" Datalife
s-side s-den. 21.50	s-side s-den. 28.50	• 8" •	s-side s-den. 24.75
s-side d-den. 26.00	s-side d-den. 30.95	s-side d-den. 31.95	s-side d-den. 26.95
d-side d-den. 31.50	d-side d-den. 34.95	d-side d-den. 34.95	d-side d-den. 31.95

3M	AMARAY MEDIA MATE		Head Cleaners
DC100A....13.95	(3½"...11.95)	(5¼"...11.95)	Kits.....5.20
DC300A...18.40	DISK MINDERS		Refills...9.55
DC300XL 20.25	(5¼"....16.75)	(8"...21.50)	Analizers 25.00
DC600A..24.45	BULK PACKED DISKS "CALL"		

Diskettes 10/Box

the Diskette Connection™

Dealer Inquiries Welcomed
1(800) 654-4058

OKLAHOMA & NEVADA

UPS Delivery Only, Add 3.00 on orders under 35.00 or 20 disk.

SOFTWARE DEVELOPERS

Save thousands of dollars! Save hundreds of hours!

by using our assembly language sub-systems

FABS

fast B-tree keyed access sub-system

- Rapid access and maintenance of large files with fixed-length records
- Versions available for CP/M-80, MP/M-II, CP/M-86, MS-DOS, PC-DOS, Microsoft BASIC(s), COBOL, FORTRAN, PASCAL, PL/I, CBASIC, CB80, CBASIC86, CB86.
- FABS directs all Access, Insert, and Delete file operations
- Key length may be greater than 50 bytes, and six key files open simultaneously
- Multiple primary key and multi-level key plus duplicate and variable-length keys are supported
- Random search time approximately 1 second, sequential step 1/4 sec.
- Deleted records are automatically reclaimed by subsequent insert operations
- Key files never need to be re-sorted: excellent error handling
- Generic search returns the first occurrence of partial key; search-next provides sequential read
- Loads resident with DOS, occupying less than 15k bytes
- Easy to incorporate into existing file-intensive applications
- Extensive commands: Create, Open, Close key file, Search (first, last, next, previous, generic), Insert, Delete, Replace key, Max Length, Open Deletes, # of Records, # of Keys

AUTOSORT

high speed Sort/Merge/Select sub-system

- Optimized for very large files; stand-alone or callable subroutine; diskettes may be changed during operation
- Versions available for CP/M-80, MP/M-II, CP/M-86 and MS-DOS, PC-DOS running Microsoft BASIC(s), FORTRAN, PASCAL, CBASIC, CB80, CBASIC86, CB86.
- Record size may exceed 5000 bytes, and file length is unlimited
- Sorts based on up to 10 fixed or variable length keys, each ascending/descending
- Key fields may be string, integer, single or double precision numeric
- Output files may consist of full records, key with record pointer, and record pointer only
- Select for retain/delete based on up to 4 keys, AND, OR, > < , =, conditions
- Single or multi-user; sorted files may be merged
- Fast . . . 4000 records of 128 bytes sorted to give key and pointer file is 170 seconds
- Boot straps itself into and out of memory claiming/restoring memory automatically
- Up to 9 different Sort/Merge/Select Modes of operation; parameters defined at run-time or read from a file
- Interactive parameter set-up program is supplied; files may be on disk drives A-Z

Retail Price $150 Each + Shipping (OEM Dealer Discounts)

COMPUTER CONTROL SYSTEMS, INC., 298 21st Terrace S.E., Largo, FL (813) 586-1886

CIRCLE 192 ON READER SERVICE CARD

Contact us for other low prices on hardware and software.

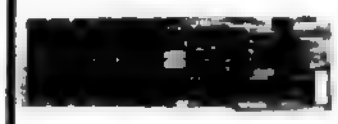
IF YOU FIND A BETTER PRICE, CALL US AND WE'LL BEAT IT.

MAKING THE PC REASONABLY-PRICED IS OUR BUSINESS. QUANTITY DISCOUNTS—FREE SHIPPING IN USA.

Next day air extra.

These prices are current as of September 14, 1984. Call for latest prices.

AST SixPak Plus™



64K

CALL

For incredibly low price.

- —Upgradable to 384K
- —Clock Calendar
- —Serial Port
- —Parallel Port
- —Software included
- —One Year Warranty

IBM PC™ **$1495**

64K, 1 DS/DD Drive

IBM is a trademark of IBM Corp.

CALL FOR PRICING.

IBM is a trademark of IBM Corp.

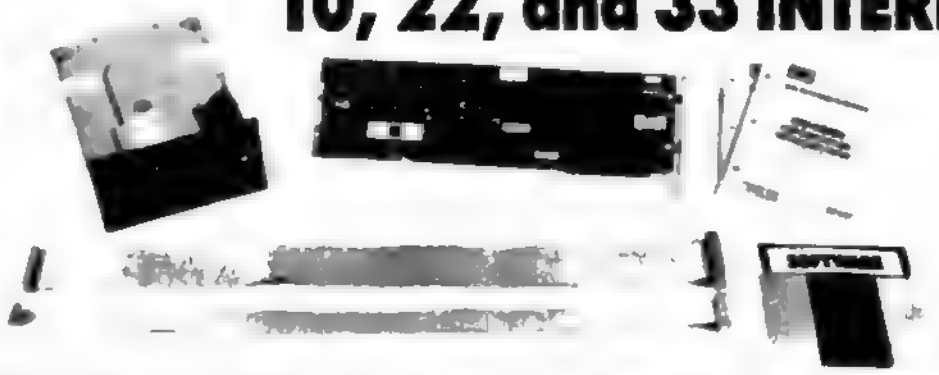
64K RAM

Set of 9 chips, 200 or 150 Nanoseconds

$39

10, 22, and 33 INTERNAL HARD DISK SYSTEMS

One year warranty



Our 10 megabyte Hard Disk System uses a state-of-the-art Half-Height Low-Power Hard Disk and Controller. The Hard Disk uses only .9A of direct current, eliminating overheating problems typically associated with Hard Drives. The system uses DOS 2.1 or 3.0 without any modifications, is Plug Compatible with the IBM XT, and gives you the ability to boot directly from the hard disk. The system comes complete and ready to install with the low power Hard Disk, Controller, Cables, Manual, Software, and Mounting Hardware.

Dealer inquiries invited

10 MEG — $749

22 MEG — $1395* 33 MEG — $1649*

*Includes extender power supply

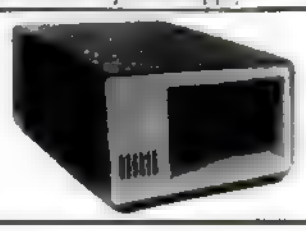
10, 22, and 33 MEG EXTERNAL HARD DISK SYSTEMS

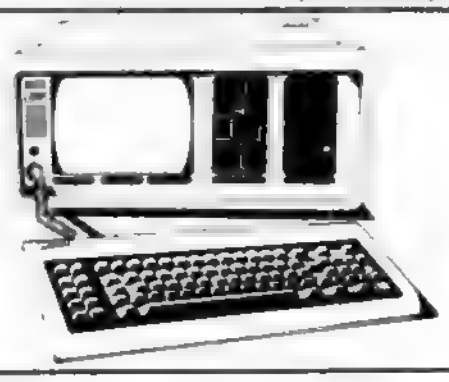
Externally mounted with independent power supply and fan
Fully DOS 2.1 or 3.0 compatible

Dealer inquiries invited.

One year warranty.

10 Meg	22 Meg	33 Meg
$949	$1495	$1749





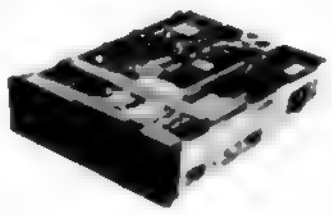
COMPAQ®

Functional equivalent to a Compaq Plus.
256K, 1/360K drive, 10 Meg Internal

Now using 3½" shock-mounted Winchester drives. The same as used in the Compaq Plus.

Dealer inquiries invited **$3495**

Also available with 2 half height drives — **$3695**

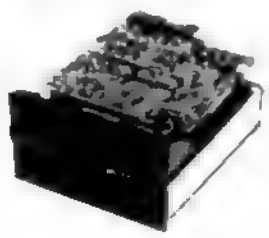


TEAC DISK DRIVES

Half-Height
55-B, DS/DD
$149

Tandon
TM 100-2, DS/DD
$199

Control Data
9409, DS/DD
$189



PC'S LIMITED

ORDERS ONLY, CALL 1-800-IBM-5150

7801 N. Lamar, #F-1, Austin, Texas 78752/ (512) 452-0323

CIRCLE 179 ON READER SERVICE CARD

SOLD!

A self-paced tutorial program that helps sales professionals polish their selling skills. Included with *SOLD!* is *Sales Manager*, a database management program that keeps track of prospect data, reminders, and appointments.

The tutorial includes sessions on planning sales calls, setting goals, developing effective openings and probes, determining a product's best-selling features and benefits, and anticipating objections and the closing. In practice simulations of sales calls, the software gives points for correct answers, which are later converted to sales figures. If the learner accumulates $100,000 or more in sales, the program provides an electronic pat on the back—complete with flashing lights and music.

(List Price: $79.50)
Requires: 128K RAM, one 320K drive, PC-DOS.
Courseware, Inc.
10075 Carroll Canyon Rd.
San Diego, CA 92131
(619) 578-1700

CIRCLE 757 ON READER SERVICE CARD

4-1-1

A content-based document locator capable of finding a file among hundreds that may be stored on the user's hard disk. *4-1-1* works in conjunction with the user's word processing program and other document editing systems to maintain a database of every word in every document filed with the software. Using the *4-1-1* indexes, documents can be located by content rather than by filename without resorting to special keywords.

The software presents the user with a spreadsheet-style "locate form," with which the user can specify the word or words that might be found in the needed document. Additionally, *4-1-1* provides a document-archiving system that backs up files and then provides an on-line index to files that have been moved from the hard disk to floppy disks.

A document security mode incorporated in the system uses a two-key encryption method that alters documents to prevent unauthorized access and use. *4-1-1* is compatible with files created by *WordStar* and with the Select line of word processing software.

(List Price: $149)
Requires: 256K RAM, hard disk, PC-DOS, word processor.
Select Information Systems
919 Sir Francis Drake Blvd.
Kentfield, CA 94904
(415) 459-4003

CIRCLE 754 ON READER SERVICE CARD

SalesPrompt

A menu-driven program designed to aid telephone or direct-sales people by rapidly correlating and displaying critical sales data. Some of the major elements of *SalesPrompt* include a product/features comparison chart, a features/benefits comparisons mode, and an instant-access word processing mode for taking notes.

The program's feature benefit mode stores facts about a company's products, as well as selling statements about each product. Up to three levels of data can be stored and later accessed, each level with progressively more detailed information. A keyword directory for rapid access to specific data is automatically created as features and benefits are entered.

The product versus features comparison chart uses independently scrolled columns to aid salespeople in matching the product and options available to a customer's needs.

Additional features of *SalesPrompt* include screen-editing utilities, a dynamic prompting system, automatic formatting, and fact-highlighting routines. Separate salesmen's packages are available to aid in creating individualized sales presentations.

(List Price: $495; salesmen's packages, $99)
Requires: 128K RAM, two 320K drives, UCSD p-System (supplied).
Infacs Corp.
240 Grand Ave.
Leonia, NJ 07605
(201) 947-0035

CIRCLE 748 READER SERVICE CARD

***SalesPrompt**, Infacs Corp.*

C Utilities

A set of programming tools enabling the C programmer to call functions that control screen attributes, peripherals, sound, graphics, animation, and math operations. All function algorithms are written in assembly language for speed of execution. The assembly modules form a separate code segment that does not require space from the 64K RAM code segment used by such C compilers as Lattice C and Microsoft C.

C Utilities is divided into functions as follows:

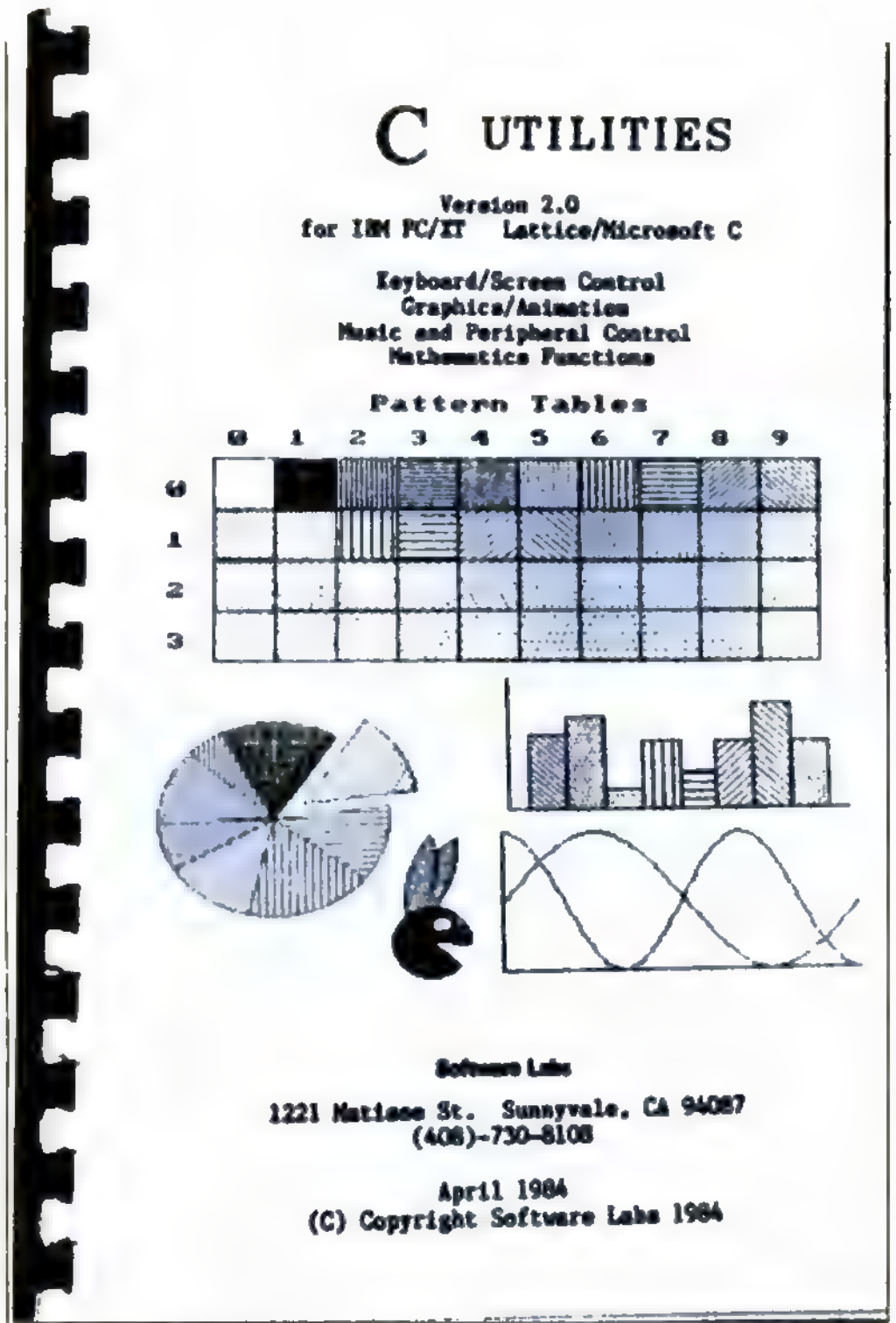
- Screen control, including functions for menu selection, function key selection, full-screen input, window scrolling, multiple-screen pages, inverse video, blinking characters, multiple color strings, and various cursor sizes.
- Peripheral control, providing a random number generator, date/time function, RS-232 serial port control, parallel printer port control, I/O port control, background music and sound generator, and a terminal emulator.
- Graphics, including functions for drawing dots, lines, circles, and ellipses. It also provides a graphics cursor and lightpen, mouse, and joystick support.
- Animation, with multiple-pattern fill, picture store, and picture animation.
- Math utilities, including sin, cosine, tan, arcsin, arccos, ln, log10, exp, power, root, and square root.

(List Price: $119)

Requires: 128K RAM, two disk drives, Lattice or Microsoft C compiler.

Software Labs
1221 Matisse St.
Sunnyvale, CA 94087
(408) 730-8108

CIRCLE 761 ON READER SERVICE CARD



C Utilities, Software Labs

Corporate Profiles

A program for managing personnel recruitment records. *Corporate Profiles*, designed for use with a hard disk, allows the user to maintain a database of prospective employee candidates. Using qualifying codes and weighting factors, the recruiter can precisely define the criteria for selecting candidates from the database. Reports can be generated for individual candidates or selected subsets of the database based upon entered criteria.

In addition, *Corporate Profiles* includes provisions for keeping track of all activities involved in the recruiting process, from the initial contact to final placement. To ensure confidentiality, access to candidate records is controlled through the use of a password security system.

The software is based upon the *KnowledgeMan* database management system. Users of *KnowledgeMan* can further extend *Corporate Profiles*'s capabilities in such areas as graphics, though the second program is not required.

(List Price: $600; with KnowledgeMan, $1,000)

Requires: 128K RAM, 10-MB hard disk, PC-DOS 2.0.

Whelan Associates Inc.
P.O. Box 650
Spring House, PA 19477
(215) 643-7470

CIRCLE 769 ON READER SERVICE CARD

ACCESSORIES

Mini-Printer Stand

A printer stand sized to hold Epson and similar printers weighing less than 30 lbs. The stand is made of smoked acrylic plastic and allows paper to be stored underneath the

printer for convenient feeding.
(List Price: $36)
Omnium Corp.
201 N. Second St.
P.O. Box 186
Stillwater, MN 55082
(612) 430-2060

CIRCLE 776 ON READER SERVICE CARD

CRT Optimizer

An antiglare screen available in sizes to fit most popular CRT monitors. The screen, made of etched polyester, attaches to the front of the user's display without tools. Its nonreflective surface also acts to enhance the screen image and reduce eyestrain.
(List Price: $39)
Omnium Corp.
201 N. Second St.
P.O. Box 186
Stillwater, MN 55082
(612) 430-2060

CIRCLE 777 ON READER SERVICE CARD

MAC-INKER

A printer ribbon re-inker, extending practical ribbon life. The device contains emulsified lubricant for safe dot matrix printhead operation. An average ribbon can be re-inked up to 50 times before it must be replaced.

The MAC-INKER is available for a wide range of popular printers, in single- and multiple-color models.
(List Price: $54.95 to $69.95, depending upon model)
Computer Friends
6415 SW Canyon Ct., #10
Portland, OR 97225
(800) 547-3303
(503) 297-2321

CIRCLE 778 ON READER SERVICE CARD

***MAC-INKER**, Computer Friends*

***K-POWER Computer Book Series**, Scholastic Books*

PUBLICATIONS

K-POWER Computer Book Series

A series of BASIC program books written primarily to introduce children to programming through theme-oriented games they enter themselves at the keyboard. The series includes *Computer Space Adventures, Computer Monsters, Computer Craziness,* and *Computer Olympics,* by authors Paul Somerson and Stephen Manes. The series also teaches skills such as geometry and physics through the games played. Each book in the series contains dozens of BASIC programs.
(Cover Price: $4.95 each)
Scholastic Books
730 Broadway
New York, NY 10003
(212) 505-3000

CIRCLE 753 ON READER SERVICE CARD

The Technoletter

A newsletter intended for nontechnically oriented computer users. Each issue includes how-to articles on the more obscure and less

well-documented features of such software as *dBASE II*, Lotus's *1-2-3*, and *WordStar*. Sections called Horror Stories and Cute Tricks share the experiences of readers.
(Yearly Subscription: $30)
The TechnoLit Center
1001 Connecticut Ave.NW, #628
Washington, DC 20036
(202) 293-0909

CIRCLE 766 ON READER SERVICE CARD

The First Family Computer Book

A good-humored approach to introducing personal computing to home life. *The First Family Computer Book*, by authors Ed and Steven Baldwin, discusses the uses of the PC in such home areas as appliance control, learning foreign languages, and managing finances. In addition, it provides a step-by-step strategy for selecting a personal computer for home use.

Also covered is what to expect from computer programs, how to find computer classes, and how computer clubs are organized. Appendixes include a glossary of terms and a sample BASIC program.
(Cover Price: $12.95)
Chilton Book Co.
Radnor, PA 19089
(800) 345-1214
(215) 964-4000

CIRCLE 771 ON READER SERVICE CARD

***The First Family Computer Book**, Chilton Book Co.*

Desktop Graphics for the IBM PC

A guide to producing presentation quality business graphics. Taking an "instant" hands-on approach, author Corey Sandler presents a layman's introduction to graphing theory and statistics and explains the hardware and software options available on the market. Also included are detailed reviews of such popular graphics software as *VisiTrend/Plot*, *The Peachtree Business Graphics System*, *BPS Business Graphics*, and Lotus's *1-2-3*.
(Cover Price: $14.95)
Creative Computing Press
One Park Ave.
New York, NY 10016

CIRCLE 779 ON READER SERVICE CARD

New on the Market Submission Guidelines

1. Please include the retail price, distribution methods, and details of both hardware and software requirements needed for an end-user to properly use your new product. For software especially, this includes required amount of RAM, number and type of disk drives, operating system(s) supported, and any peripheral equipment needed.
2. Releases should be typewritten double-spaced on one side of the paper. Copies of advertisements for the product may be included, but in most instances we need more information about a product than is typically included in an ad.
3. Include telephone contacts for marketing and technical questions.
4. If available, include black-and-white glossy photos of the product, 4 × 5 in. or larger.

Please note that all products are run on a space-available basis. It is impossible to guarantee publication of a product announcement for any particular issue.

Inclusion in **New on the Market** is at the exclusive discretion of the editor.

SERVICES

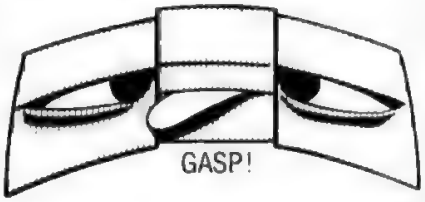
Instant Yellow Page Service

A new on-line database service providing instant access to every Yellow Page directory in the U.S. The user can dial in and retrieve data from a database of over six million directory listings.

Search parameters are flexible enough to permit the compilation of direct mailing lists and telemarketing/sales leads. Data can be stored or printed locally for a minimal fee.
American Business Lists Inc.
P.O. Box 27347, Dept. N
Omaha, NE 68127
(402) 331-7169

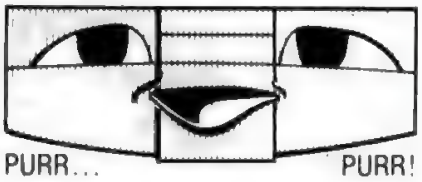
CIRCLE 765 ON READER SERVICE CARD

It's too late when you can see that your disc drive has problems...



ReadiScope™

is your eyes and ears *inside* your disc drives.



ReadiScope **is a comprehensive diagnostic program that analyzes the current status of a diskette drive. It graphically displays the alignment pattern so that adjustments to head, spindle hub alignment, and rotational speed can be made in minutes without special equipment.**

- **Floppy drives, single or double sided drives, can be tested while installed under normal operating conditions**
- **Ideal for use by: PC Clubs; Users with Critical Data; Repair Shops; Multi-PC Users; Retail Stores**

Requires 48K IBM PC with one operating drive. Uses monochrome or graphics display. $295. including special diagnostic diskette.

Visa, Mastercard or MO. Add $3. for shipping. In CT, add 7.5% tax.

Call 203-431-3521 or send your order now to:

ReadiWare Systems, Inc.

Box 680, W. Redding, CT 06896

CIRCLE 189 ON READER SERVICE CARD

Say goodbye to the Tower of "APPLE" Babel

M to APPLE to IBM to APPLE

File Transfers are easy as pie with APPLE-TURNOVER™

READ, WRITE, and FORMAT Apple© II DOS 3.3 and Apple CP/M disks in your PC or most compatibles.

No need for exasperating serial links or modem madness. Leave your Apple where it is. All formatting and file-transfers are easily accomplished on your PC.

The APPLE-TURNOVER package consists of a half-sized card, friendly supporting software, and complete documentation. $279.50.

See your dealer or call for information.

Vertex Systems Inc.
INNOVATION IN MICROCOMPUTER PRODUCTS

Dept. M, 6022 W. Pico Blvd.
Los Angeles, CA 90035
(213) 938-0857

Apple is a registered trademark of Apple Computer Inc. IBM is a registered trademark of International Business Machines Corporation.

CIRCLE 130 ON READER SERVICE CARD

Free Catalog!

Your 80-page guide to computer supplies and accessories–including complete new product descriptions.

- Packed with over 1600 products for microcomputers, minicomputers, and word processors – many available nowhere else.
- Big special section devoted to new supplies and accessories.
- Comprehensive product descriptions – including more than 475 full-color photos – clearly explain features and benefits.
- Easy-to-use cross reference guides to magnetic media, ribbons, and more–along with the industry's most complete cable guide.
- Helpful suggestions and tips, ranging from flexible disk care to proper ribbon selection to useful application ideas.

Phone toll-free 1-800-547-5444

In California, call 1-800-547-5447

inmac™

Phone toll-free 1-800-547-5444* or send coupon today.

Inmac Catalog Dept
2465 Augustine Drive
Santa Clara, CA 95051

Please rush my free copy of the Inmac Catalog. I understand there is no obligation whatsoever

NAME
COMPANY
ADDRESS
CITY
STATE ZIP PHONE

*In California call 1-800-547-5447

431110

CIRCLE 225 ON READER SERVICE CARD

PC User Groups

This list is a partial directory of PC user group names and addresses. Use this listing to locate other PC aficionados who congregate in your area or around the world.

OHIO

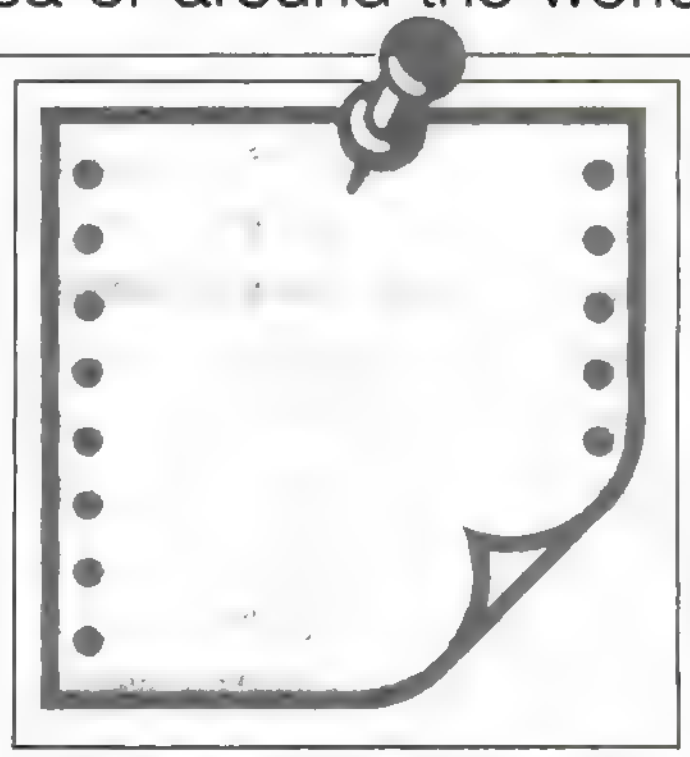
IBM-PC Users Club
c/o Chuck Harrington
315 Cutler Hall
Ohio University
Athens, OH 45701
(614) 594-6125

Northeast Ohio PC Club
c/o Kelvin Gerhart
P.O. Box 662
North Olmsted, OH 44070

Greater Cleveland PC Users Group
c/o Roy McCartney
30704 Royalview Dr.
Willowick, OH 44094
(216) 944-5173

Miami University IBM-PC Users Group
c/o Debra Allison
The Computing Center
Miami University
Oxford, OH 45056

Mansfield Area IBM PC Users Group
c/o Gary Stiffler
1145 Conwell Ave.
Willard, OH 44890



Akron/Canton PC Users Group
c/o James C. Finucane
10690 Clapsaddle Ave.
Alliance, OH 44601
(216) 935-0252

Columbus IBM-PC SIG
c/o Frank R. Neal
1358 Byron Ave.
Columbus, OH 43227
(613) 239-9300

The Ohio State University IBM PC-Users' Group
c/o Art Krumsee
Office of Continuing Education
210 Sullivant Hall
1813 North High St.
Columbus, OH 43212

OKLAHOMA

IBM PC Users Group
c/o Roger Baresel
Deloitte Haskins & Sells
700 Fidelity Plaza
Oklahoma City, OK 73102
(405) 232-6191

IBM Personal Computer Users Group (PCBUG)
c/o Lynn Long
P.O. Box 471114
Tulsa, OK 74147-1114
(918) 749-6396
(918) 628-1400

PC will publish a periodic listing of PC user groups. Send new addresses or address changes to "Club News," *PC*, One Park Ave., New York, NY 10016. New groups and address changes are shown entirely in **boldface.**

OREGON

PC Users Group
c/o Greg Estes
P.O. Box 5070
Eugene, OR 97405

Portland PC Users Club
P.O. Box 2068
Beaverton, OR 97075

Corvallis PC Computer Club
c/o Bob Collins
P.O. Box 1977
Corvallis, OR 97339

PENNSYLVANIA

International Personal Computer Owners
c/o James B. Cookinham
IPCO Inc.
P.O. Box 10426
Pittsburgh, PA 15234
(216) 757-1871
CompuServe: 71545467

Harrisburg PC Users Group
c/o Jack Stahl
1195 Fairmont Dr.
Harrisburg, PA 17112
(717) 652-9097

Microcomputer User Group (MUG)
The Pennsylvania State University
Computation Center
Computer Building
University Park, PA 16802

Philadelphia Area IBM PC Club
c/o Bennett Landsman
2041 Harbour Dr.
Palmyra, NJ 08065
(609) 786-1441

Pennsylvania IBM Group
c/o Ron Kester
1018 Greenlawn Dr.
Pittsburgh, PA 15216
(412) 381-2898

RHODE ISLAND

Rhode Island PC Users Group
c/o Mike Mahoney
University of Rhode Island
Tyler Hall
Kingston, RI 02881
(401) 792-2301

SOUTH CAROLINA

Palmetto Personal Computer Club
P.O. Box 2046
Columbia, SC 29202

Upstate IBM-PC Users Group
c/o Gary Teska
1102 Fork Shoals Rd.
Simpsonville, SC 29681
(803) 243-3970

TENNESSEE

IBM PC User Group
c/o Ross Burrus
Science Applications, Inc.
Plaza Tower, #801
Oak Ridge, TN 37830
(615) 482-6649

Memphis Area IBM-PC Users' Group
c/o Peter Vermilye
P.O. Box 241756
Memphis, TN 38122
(901) 345-8760

TEXAS

Bay Area Personal Computer Organization (BAPCO)
c/o Earl Rubenstein
P.O. Box 58098
Houston, TX 77058-8098

Centex PC Users Group
c/o Patti Anderson
P.O. Box 10169
Austin, TX 78766-1169
(512) 458-6996

Houston Area League of PC Users
c/o Duane C. Hendricks
P.O. Box 610001
Houston, TX 77208
(713) 831-3367
(713) 772-1371

Dallas-Fort Worth User Club
c/o Samuel P. Cook
309 Lincolnshire
Irving, TX 75061
(214) 253-6979

West Texas Personal Computer Users Group
P.O. Box 8951
Amarillo, TX 79114

Texas User Group
c/o Ken Holcombe
178 Tipperary
San Antonio, TX 78223
(512) 333-7163

Southwest IBM PC Users Group
c/o William G. Barker & Associates
1009 West Randol Mill Rd., #212
Arlington, TX 76012

North Texas IBM-PC Users Group
2025 Rockcreek Dr.
Arlington, TX 76010

Longview Users Group
c/o Ron Ferguson
P.O. Box 2504
Longview, TX 75606
(214) 753-2292
(214) 983-3824

UTAH

Utah Blue Chips
150 W. North Temple, Room 251
Salt Lake City, UT 84114 ■

PC BlueBook

Rates and Information

PC: BlueBook is a high-response, low-cost source for advertising in the fastest growing computer market in the world. Advertisers choose between set categories and may include a logo. Display advertisers may cross-reference to their current display ad.

Circulation: 200,000 Paid Circulation Rate Base. Readership: 420,000 Est.

AD STYLE

1 line Heading (25 characters maximum). 7 lines Body Copy (45 characters per line). 4 lines for Company name, address and telephone.

RATES

Per Issue: $200. Additional Lines: $20 per line. Logos: $125 per issue. Minimum Order: 4 times within 6 issues period. Terms: Prepayment is required. Check, money order, American Express, Diners, VISA or MasterCard are accepted.

DEADLINES

October 31th for the January 8th issue, on sale December 18th. Send your ad and prepayment to: PC BlueBook, Classified Advertising, 12th Floor, One Park Avenue, New York, NY 10016. Advertising sales: (212) 503-5115. Customer service: (212) 503-4506

ACCESSORIES SUPPLIES

IBM TYPE BINDERS, SLIPS

Complete program packaging line. D-ring cloth binders, slip cases, floppy pages, game portfolios. Continuous paper with three large holes, 20 lb. to go in binders. Blank disk envelopes. Function key cards tell user your F1-F10 meanings. Call, write for prices. Catalog. Fast service, low prices.
ANTHROPOMORPHIC SYSTEMS LIMITED
376 E. St Charles Road
Lombard, Il 60148
(312) 629-5160

IBM ACCESSORIES

High Quality Joystick for IBM	$ 22.95
Teac FD55B (½Ht DS/DD) disk Drive	$185.00
IBM look-alike metal case	$ 99.00
IBM Keyboard w/conventional shift key	$160.00
IBM Disk Controller w/cable (4 Dr.)	$175.00
Disc Storage Case (Holds 75)	$ 19.95

Send $1 for Cat. Credit up to $50 on 1st order
WELLWAY INT'L CORP
765 S. State College, #E,
Fullerton, CA 92631
(714) 526-7922

RESET BUTTON FOR THE PC

AT LAST! No more need to turn off your computer switch to reboot. A tap on the button and your computer will always reboot quickly and safely. The button installs easily with simple to follow instructions. The kit is for the PC or XT, please specify. $29.80 (add 6% in MN). Call for info or to order
RESET CORPORATION
PO Box 14809
Minneapolis, Minnesota 55414
(612) 489-5892

BUSINESS OPPORTUNITIES

MEDICAL/DENTAL FRANCHISES

Software development company needs to establish dealers. Open item accounts receivable systems will print patient statements, all third-party insurance claims, patient & clinical recall, day sheets, financial & statistical reporting for the medical office. Installed & supporting over 75 medical offices nationwide.
MTA MEDICAL SYSTEMS
4825 Heffield Circle
Syracuse, NY 13215
(315) 488-1518

MARKET RESEARCH & SURVEY

Enterpreneurs needed to establish local branches of R/S dept. related to Computer, Consumer & Engineering products. Regular amazing second income filling R/S Questionnaires for Domestic & International Corporations. Serious limited offering. Free products for evaluation, Review & Testing. Send $3 or stamps for package.
KBW & ASSOCIATES, Engineers-Consultants
P.O. Box 1304
Cerritos, CA 90701
(213) 926-3761 TLX. 4940708

COMPATIBLES

LF COMPUTER PRODUCTS

IBM PC & Commpatibles, Drives, Boards, Printers Preachtree software. GL, AR, AP, Inv Ctrl $389 ea. Back to Basics set: Accting for IBM $225. Complete lines of software at Bargain Price. Training Course & Handbook. Dynax Printer $429. New LF 5¼" High Quality Disks 100% Error Free. SSDD $1.75, DSDD $2.25, 3½" Disks, Mag Tapes
LF COMPUTER PRODUCTS
8660-D Miramar Road, #265
San Diego, CA 92126
(619) 566-6823

COMPUTER TRAINING

VIDEO TUTOR

"How to use your PC in 10 easy video lessons for the IBM PC & XT." An award-winning video providing keyboard, disk formatting, operating systems, software applications & an intro to BASIC. Retail $79.95 & $3.50 s/h, in BETA & VHS. Software titles available soon. Ask about our custom video & interactive video-disc.
KENNEN PUBLISHING
150 Shoreline Hwy. Bldg. E
Mill Valley, CA 94941
(800) 428-7777; (415) 332-5828 in CA.

MICROREF™
QUICK REFERENCE GUIDES

GIVES YOU COMPLETE SOFTWARE COMMANDS AND PROCEDURES IN SECONDS! Thumb-indexed, easy-to-follow steps, built-in easel, durable plastic pages, illustrations, glossary & index. MICROREF Wordstar, Multiplan, VisiCalc, SuperCalc/$14.95 each. MICROREF Lotus 1-2-3/$16.95. Your satisfaction is guaranteed. Order toll-free (800) 323-6043/in Illinois (800) 942-6077.

MICROREF

EDUCATIONAL SYSTEMS, INC.
1000 Skokie Boulevard
Wilmette, IL 60091
(312) 256-4750

CONSULTANTS

GEORGIA
CUSTOM PROGRAMS/SUPPORT

Why have someone else's software when you can have your own? We write programs to meet your requirements and solve your problems. Business and health care management applications a specialty. Over 15 years experience in data processing. Let it work for you!
YOUR SOFTWARE CO.
PO Box 2672
Norcross, GA 30091
(404) 448-1274

DISKETTE COPY SERVICE

GIVE YOUR SOFTWARE COLOR

Our color disks and color graphic disks can make your software stand apart from the rest. We offer rapid duplication in over 600 formats, including Commodore 64. We guarantee 100% verified flawless copies. Serialization, copy protection, labeling, packaging and shrink—wrapping also available.

Western Transdata Inc.
DISK DUPLICATION

Western Transdata, Inc.
1701 E. Edinger Ave.-Ste. A7
Santa Ana, CA 92705
Call (714) 547-3383 collect.

BLANKET ORDER SERVICES

Diskette duplication, packaging, stocking and drop-shipping services based on your long-term needs. Place a blanket order with releases as you need them for large or small quantities at a fixed price. No extra charge for "mastering", label printing or application.
STAR-BYTE, INC.
2564 Industry Lane
Norristown, PA 19401
(215) 539-4300

9 TRACK TAPE TO DISKS

Conversion from ASCII or EBCDIC 1600 BPI magnetic tape to PC-DOS 5¼ diskettes. New high speed automated process verifies transfer. Quality guaranteed. Only FIVE CENTS per thousand characters plus $3 per diskette. $95 minimum. Other conversion available.
AUSTIN SCIENTIFIC INC.
1259 El Camino Suite 260
Menlo Park, CA 94025
(415) 323-6338

ALLENBACH INDUSTRIES, INC.

Allenbach created the industry, and we've since been imitated—but never duplicated. Copies supplied on OEM quality Allenbach LIFETIME GUARANTEE diskettes, now available in a variety of colors. Virtually all formats and systems. Copy protection, serialization, downloading and packaging available. Rapid delivery on 100 to 1,000,000 copies.

ALLENBACH
INDUSTRIES INC

ALLENBACH INDUSTRIES, INC.
2101 Las Palmas, Suite A
Carlsbad, CA 92008
(800) 854-1515, (619) 438-2258

"EACH A PERFECT ORIGINAL"

Duplication, formatting, & downloading for virtually all computer formats. CP/M 8" or 5¼" to IBM PC. We're the experts of IBM duplication. Copy protection, serialization, packaging & shrink wrapping available upon request. Competitive turnaround times. We've earned our reputation for being the best.
DisCopyLabs
1600 Wyatt Drive, Suite 10
Santa Clara, CA 95054
(408) 988-0438

DECADE OF SERVICE 3½•5¼•8

Guaranteed fast turnaround for duplication and formating on high quality OEM diskettes. Virtually all formats: Commodore, Apple, IBM PC, Kaypro, DEC, Atari, plus many more. Serialization, state of the art copy protection and custom packaging available. Personalized service is our specialty.
COMPUTER MEDIA PRODUCTS
5482 Complex St., Suite 110
San Diego, CA 92123
(619) 565-7802

HARDWARE
ADD-ON BOARDS

"VOICE I/O FOR IBM PC"

Talk back to your PC! Expansion board takes voice input, stores on disk, gives high fidelity playback. Low data storage rate (1-2 kbyte/sec). Runs under PC-DOS. We provide device drivers and demo software. DIALOG/1 with voice I/O for $295, DIALOG/2 with phone interface $495, DIALOG/3 with 300 Modem $595. Send for data sheets.

DIAL LOGIC

DIALOGIC CORPORATION
164 McKinley Avenue
East Hanover, NJ 07936
(201) 386-0202, (800) 221-0393

64K RAM EXPANSION KIT

Set of 9 factory new, tested, burned-in 150NS RAM chips suitable for use in PCII's, XT's workalikes, and memory expansion boards. Satisfaction Guaranteed or money back. Static-shielded shipping. $57.50 Set + 2.50 shipping and handling. Quantity discounts available. VISA/MC, check, M.O., COD's for cash/cashier's check
CORTEX INCORPORATED
603 W. 13th St., Suite 1A-263
Austin, TX 78701
(800) 237-8400 X333/(800) 282-1469 X333 in FLA.

FIXED DISK BIOS/BOOT

FIXT boots from DATAMAC, DAVONG, XEBEC, PERCOM, GREAT LAKES, ZOBEX, others. Adds XT-like BIOS interface for your disk to IBM PC or COMPAQ. Plug-in installation. DOS 2.0/2.1 reqd. Specify controller model with order $70 + $3 shpg. + tax. MC/VISA. (Optional volume support at additional cost.)
GOLDEN BOW SYSTEMS
P.O. BOX 3039
San Diego, CA 92103
(619) 298-9349

MEMORY EXPANSION BOARD

With dataPLUS-SIX you can have additional memory to 384K in increments of 64K with full parity checking standard. dataPLUS-SIX is 100% compatible with all versions of the IBM-PC and XT as well as IBM look-alikes. The price is $139.00 for card and $50.00 for 64K RAM (9 chips). ONE YEAR WARRANTY.
dataPLUS
6118 Chesebro Rd.
Agoura Hills, CA 91301
Call 1-(818) 706-1319

FOR SALE BY OWNER

Listing of microcomputers and peripherals for sale by owner. No broker or commission fees, buy direct from owner. Do you want to sell your system or components? Have it listed and sent only to interested parties. Listings consist of IBM-PC, IBM-XT, IBM-Portables, Apple & many others. To obtain listing or have your system listed, send $25 along with specifications to:
JEGAL CORPORATION
Box 244
Wyckoff, NJ 07481
(201) 794-0557

AST/MAYNARD/QUADRAM/HAYES

AST MegaPlus (64K) $269, SixPack (64K) $269. I/O Plus $129. Monograph plus $389. AST-3780 $659. PCNET Starter $809. MAYNARD Disk Controller $114. Sandstar,Series $Call. QUADRAM Quadboard $269. Quadcolor I $199. HERCULES card $349. Set of nine 64K chips $45. HAYES modems $Call.
VLM COMPUTER ELECTRONICS
10 Park Place
Morristown, NJ 07960
(201) 267-3268

TASCMASTER SOFTWARE

Multi-Tasking IBM-PC or IBM-PC-XT. Operating under PC-DOS, allows up to 9 tasks to be run concurrently in background mode unattended. Can work in Wordstar, do a calculation from Lotus 1-2-3, monitor modem, database sort and month-end closing from accounting Program all at once. Price $475 including Addram Plus or Addram Elite multifunction board.
PROFIT SYSTEMS, INC.
30150 Telegraph Rd.
Birmingham, MI 48010
(312) 647-5010

PC AIRFLO™—COOLS THE PC

SUPPLIES FILTERED COOLING AIR WITH A RANGE ADJUSTABLE from 0-46 cfm. Uses any air conditioning filter material. Not connected to the computer wiring. Very attractive and quiet. SECURELY ATTACHED, EASILY REMOVED. High quality U.L. parts used throughout. Grey with clear acrylic bracket. $97.94 + shipping.

ABC COMPUTER PERIPHERALS, INC.

ABC COMPUTER PERIPHERALS, INC.
77 Columbia Street
New York, NY 10002
(212) 477-1890

HARDWARE
COMMUNICATIONS

ELECTRONIC MAIL SYSTEMS

HARDWARE—300 baud COM ½ modem card ⅓ size for PC/XT compatible. Auto dial/answer direct connect. $229. Includes 1 software pkg. below. SOFTWARE—Easylink (telex) • Graphnet (telex) • Elect Mail (DDD) • OAG Community Bulletin Board (host) • Terminal Emulator • MCI Mail • $49 per pkg. Modem + all above $450. Qty. disc. Satisfaction guaranteed. MC/VISA/MO/CK/COD.
CREATIVE COMMUNICATIONS, INC.
1662 West 820 North
Provo, Utah 84601
(801) 373-9843

HARDWARE
DISK DRIVES

SMD HARD DISK CONTROLLERS AND SUB SYSTEMS

Interphase brings you the most powerful disk controller and disk subsystems available for your IBM PC or PC compatible. You can use any of the dozens of high performance Disk Drives supporting the industry standard SMD Interface. Capacities range from 16 to 1600 Megabytes, speeds 3-5 times the 5.25". Winchesters and reliable removable media too. Ideal for network file servers or large DBM applications.
Interphase Corp
2925 Merrell Road
Dallas, TX 75229
(214) 350-9000

DISK DRIVES FOR PC

Qume 142A (½ Ht)	$199
Teac FD55B (½ Ht)	$169
TM100-2, DS, 40T	$199
TM101-4, DS, 80T	$295
CDC 9409 DS, 40T	$219

MAYNARD complete Internal 10MB Winchester Hard Drive System from $959, WS1: $899, WS2: $1079
VLM COMPUTER ELECTRONICS
10 Park Place
Morristown, NJ 07960
(201) 267-3268

DISK DRIVES FOR IBM PC

TANDON	TM100-2	$165.00
SHUGART	SA455 (½ht.)	$139.00
PANASONIC	JA551-2 (½ht.)	$129.00
TEAC	FD55B (½ht.)	$139.00
64K RAM CHIPS		$4.65 ea.

Substantial quantity discounts available.
ARLINGTON COMPUTER PRODUCTS
1329 Elgin Lane
Schaumburg, Ill 60194
(312) 882-3724

HARDWARE DISKETTES

MEMOREX DISKETTES
SS/DD #6501-$21.90/10.
DS/DD #6503-$29.50/10.
Reversable #6505-$26.50/10.
SS/96 TP1 #6513-$31.00/10.
DS/96 TP1 #6514-$39.50/10.
Headcleaning Kits-$12.95 ... Printer paper-call.
$2 s+h M/C, VISA, MO, COD (+1.85), Check.
MAGNETICS, INC.
PO Box 98
South Grafton, MA 01560
1 (800) 334-DISK; (617) 839-4404

DS DD DISKS $17 PER BOX
DS DD Disks-$17 00 box of ten
SS DD Disks-$14.50 box of ten
OMNI critically certified warranted for 5 years. Shipping add $2.95 per 100 or fraction thereof. Visa & Mastercard accepted COD orders only add $3.00 VA customers please add 4% sales tax
SOFTPAQ, Inc.
P.O. Box 674
Bluefield, VA 24605
Call COLLECT (703) 322-5956

DD/DS DISKETTES $25
100% Lifetime Replacement guarantee 10 pack of Echo Brand Diskettes. Highest quality used by software companies to distribute their products. M/C or VISA or check or you pay COD. CA: residents add 6% sales tax. Echo Brand head cleaning kits $10.
DataFlow
PO Box 2872-P
Santa Rosa, CA 95405
(707) 575-9709

DISK/HARDWARE-BIG SAVINGS
D/D Verbatim $26; 3M $23; Maxell $29; Ultramag $23; Bulk $21; S/D any brand $20 & lower; Mitac ½ drive $189; 10MB $849; Hayes 1200B $399; Multitech or Ventel with Sft. $419; Gemini $269; Oki 92/93/84 $419/619/939; M. Tally 160/180 $556/769; S. Reed 500/550/770 $379/489/989; Taxan RGBvision $489. Much more! Visa/MC/COD.
AM RESEARCH
P.O. Box 20170
Cincinnati, Ohio 45220
(513) 861-SOFT

DISCOUNT DISKETTES
DYSAN SS/DD $22/10, DS/DD $29/10. ECHO (lifetime guarantee). SS/DD $15/10. DS/DD $19/10. 3M DS/DD $22/10 (lifetime warranty). Cash-deduct 3%. S&H $3. $1.50 credit on long-distance phone orders over $50. VISA/MC, COD (+ $2). Ill. res. add 8% tax. Write for free price list & computer book list.
SCAMP SYSTEMS, INC.
Box 59451
Chicago, Illinois 60659
Phone: (312) 267-9859

HARDWARE MONITORS

FINEST .31 MM PITCH RGB
Monitor in price range, our PX-1V is BETTER than Princeton Graphic Sys HX-12, larger 13" screen + sharper colors with TILT SWIVEL BASE, GREEN TEXT MODE, + cable. LIST $695. Also, CGA Color Graphic BD (runs fit. sim + LOTUS 1-2-3). CGA LIST $244. Our price PX-1V at $469. CGA at $160. PX-1V w/CGA $599.
M SYSTEMS INC.
27 Station Square
Bergenfield, NJ 07621
(201) 387-1109

HARDWARE PERIPHERALS

BAR CODE READER SUBSYSTEM
Consists of Bar Code wand, Decoder unit, cable to connect to Async port on IBM PC/XT or other compatibles, and interactive SW pack & Doc. Unit reads high, med., low density Bar Codes. Code 39. UPC, EAN, 2 of 5, 12 of 5, Codabar, Ames, Code 11, others. Various Baud rates. $895. Dealer pricing available.
DATAFLOW TECHNOLOGIES, INC.
8422 Bellona La., Suite 303
Towson, MD 21204
(301) 296-2632/666-2366

BAR CODE READERS/MAGNETIC STRIPE READERS
TPS provides Bar Code and Magnetic Stripe Readers and combinations of these for simple installation on IBM PC, PCjr, DEC Rainbow, Professional VT200 series terminals, NCR Decision Mate V, TI Professional, etc. They connect between the keyboard and the PC so that no card slot or programming is required. $695-$995.
TPS ELECTRONICS
4047 Transport Street
Palo Alto, CA 94303
(415) 856-6833

KROY® INTERFACE
The K Retro interface automates the KROY® 80E lettering machine using the IBM PC, APPLE II/III, etc. Advantages are speed, simple installation, full display, edit, multiple copies, save/recall text, auto Kern, & auto sequence. An RS 232C version is also available for use w/any other terminal/computer. Approx $995.00.
THE MEYER COMPANY
400 Elysian Fields
Oakland, CA 94605
(415) 569-8600 in sprint-844-4460 (toll free)

HARDWARE POWER PROTECTION

SURGE SUPPRESSORS
Protectall™ surge suppressors protect your computer from voltage spikes. Two models, each with 6 outlets, monitor light, ivory case and 2 year warranty. Appx. 3.5" × 5". Components UL listed. PRO-1 plugs into wall socket, $39.95; PRO-2 w/ master, on/off switch, 6' cord, $59.95. Add $2 handling OH res. + 5.5% tax. Visa/MC/CK.
PAXTON PRODUCTS, INC.
1101 Paxton Rd. Ste. 7
Cincinnati, OH 45208
(513) 321-0400

MEIRICK STAND-BY POWER
THE MEIRICK STAND-BY POWER SYSTEM provides back-up power & protection from power failures, brownouts, surges, spikes, and power line noise. The enclosed battery will keep a computer running for greater than 20 minutes during a power failure. 400 watt system-$495-800 watt system-$795.
MEIRICK, Inc. POWER SYSTEMS DIVISION
Box 298
Frisco, CO 80443
(303) 668-3251

HARDWARE STORAGE DEVICES

SRI WINCHESTER SUBSYSTEMS
Internal 10 MB hard disk for IBM PC. WESTERN DIGITAL controller. Tested & formatted, complete kit $1050. No change in BIOS, boot from hard disk. Simple to install like a floppy, DOS 2.0. Several installed, 1 year factory warranty. Additional 10 MB hard disk $750. Tape back-up & removable HD systems available.
SRI DATA SYSTEMS
9 East Pleasant Avenue
Maywood, NJ 07607
(201) 684-4518

MAILING LISTS

IBM MAILING LISTS
Over 100,000 names of IBM personal computer owners (counts increase daily) available for rental on labels or magnetic tape. Total 600,000 including other brands. Plus IBM + compatible retail store + 50 other lists. Call or write for free Catalogue
IRV BRECHNER
TARGETED MARKETING, INC.
Box 5125
Ridgewood, NJ 07451
(201) 445-7196

PUBLICATIONS CATALOGS

PC BUYERS GUIDE
THE INDEPENDENT GUIDE TO PRODUCTS AND SERVICES FOR IBM Personal Computers. This master directory lists, describes, rates for ease of use, and tells you about the latest in software, hardware, accessories, supplies, books, services, et al. Everything for you and your IBM PC. It even includes an Index of Computer Camps for both adults and children. From the publishers of PC. An ideal gift at only $7.95 (+ $1.55 shipping/handling) to U.S. destinations; and $11.00 elsewhere. Residents of CA, CO, CT, DC, FL, IL, MA, MD, NJ, and NY add applicable sales tax. Checks or MasterCard or VISA acceptable (with number, expiration date and signature). U.S. funds only. Mail to:
PC BUYERS GUIDE
CN 1914
Morristown, NJ 07960

RETAILERS

HAWAII

COMPUTERLAND OF HAWAII
IBM PC and a full line of peripherals, software, and books IBM authorized in-store and on-site service. Maintenance contracts and classes available. Call us for details.
Stadium Mall (808) 487-0030
Kawaiahao Plaza (808) 521-8002
46-208 Kahuhipa St. (808) 247-8541
Kaahumanu Center, Maui (808) 871-9566

NEW YORK

THE KNOWLEDGEABLE COMPANY
We have a large selection of peripherals for IBM and IBM compatibles at 20% to 30% off retail price. If there is something you don't see please let us know. Chances are that we have it or can get it for you at our lowest prices. Let us know what you need and we'll get it for you with the best of our knowledge.
ART COMPUTER PRODUCTS INC.
1617 Cortelyou Rd.
Brooklyn, NY 11226
(212) 284-4472

SECURITY

NEW! LOW COST XT SECURITY
LOCKIT—$129.95 Prevent BOOTUP of XT unless PW typed in. Easily changeable by you. Skip "A" drive boot. Hardware Module. NO exp. slot. PC RESET-True hardware Reset-PC or XT. With QUICKON-$89.95. w/o QUICKON-$29.95. With LOCKIT-$144 95. Remote-add $10. All are very easy to install. MC, VISA.
SECURITY MICROSYSTEMS CONSULTANTS
16 Flagg Pl., SUITE 102 PC
Staten Island, NY 10304
(212) 667-1019

PASSWORD CONTROL YOUR PC's
PC LOCK II allows file by file password and encryption protection. With the lock in place, your computer will not boot without entering a correct PW. Ideal for small multi-user environments. XT FORMAT wipeout protection. A 5" × 4" card with diskette, 38 changeable passwords. KEEP YOUR PC STRICTLY PERSONAL.

PC Lock II™

MPPI, LTD.
2200 Lehigh Rd.
Glenview, IL 60025
(312) 998-8401

IBM PC DATA SECURITY
WATCHDOG™ security system provides access control and data encryption protection for information stored on IBM PC/XT, IBM PC with add-on disk. Data may be partitioned into secure units. Menu screens ease selection of programs and files. Audit trail reports usage. $295 each. Quantity discounts

WATCHDOG

FISCHER-INNIS SYSTEMS CORPORATION
4175 Merchantile Ave.
Naples, FL 33942
(800) 237-4510 Toll Free/
(813) 793-1500 (in Florida)

SOFTWARE ACCOUNTING

ACCOUNTANTS SOFTWARE
Finally! A software source for the practicing accountant with programs designed especially for the professional practitioner. Tax Planner, Depreciation, After-The-Fact Payroll, Form #1099 Generator, Account Analysis and Client Information System are just a few of many. Call or send for our complete catalog.
OMNI SOFTWARE SYSTEMS, INC.
146 North Broad Street
Griffith, IN 46319
(219) 924-3522

ARCHITECTS AND ENGINEERS
AEMAS System is designed specifically for architects, civil engineers & other professional firms where monitoring project costs is required. Modules available are job costing, payroll, A/R, A/P, general ledger & automatic invoicing. Interactive modules stand alone or run in any combination. Contact Bill Fraedrich.
DATA-BASICS, INC.
11000 Cedar Rd. #110
Cleveland, OH 44106
(216) 721-3400

DJBA PAYROLL CONTROL
Now even the most complex payroll is simple with this easy-to-use menu-driven program. Calculates all taxes and supports multiple wage rates or salaries and user-defined deductions. Prints checks, W2's, reports (current period, YTD summary, etc.) in order by name, employee #, SSn, or zip. Extensive error protection, foolproof data entry, password. Tax updates, minor customizing and full phone support included. Compilable. $300 complete.
D.J. BAILEY ASSOCIATES
3438 West 83rd Place
Chicago, IL 60652
(312) 434-6658

PRACTICING ACCOUNTANTS
Ten of the top 12 CPA firms use Accountants Microsystems, Inc. Software for Professionals. DATAWRITE™ client write-up allows custom reports, packs mainframe power onto your micro. Expand your practice with Fixed Asset Management, Post Facto Payroll, Practice Management and the TAX MACHINE.™ Nationwide Training/Support.

ami

ACCOUNTANTS MICROSYSTEMS, INC.
3633-136th Place SE
Bellevue, WA 98006
(800) 426-8201, (206) 643-2050

CUSTOM PAYROLL
All systems support multiple pay categories, calculation of all taxes, user-defined deductions, exceptional item handling, a variety of necessary reports, paychecks and W-2 forms. Written in PC Basic with full source included for easy maintenance. Prices start at $695.00 for basic system and manual.
DATASMITH, INC.
Box 8036
Shawnee Mission, KS 66208
Phone: (913) 381-9118

CONSTRUCTION ACCOUNTING
CMAS system is designed specifically for commercial contractors where tracking job costs is required. Five modules available are job costing, Payroll, A/R, A/P, and general ledger. Interactive modules run stand alone or in any combination. Contact Jeff Kilb.
Data-Basics Inc
1100 Cedar Road #110
Cleveland, OH 44106
(216) 721-3400

PC-FUND
PC-FUND is a fund accounting system for local govts, schools, colleges, and not-for-profit groups. The system includes. General Ledger, Report Writer, PO/Encumbrance, payables, receivables, payroll/personnel, budgeting, utility billing and fixed assets. The system supports up to 99 funds, 9999 departments and up to 36 fiscal periods are on line. PC-FUND runs on the IBM-PC and most MS-DOS computers.
AMERICAN FUNDWARE, INC.
P.O. Box 773028
Steamboat Springs, Colorado 80477
(303) 879-5770

PERIODIC INVENTORY/SALES
For Retailer, Wholesaler, Warehouse, Restaurant, Parts, Supplies. PERIODIC Accounting MTD (Avg. Cost, FIFO or SI). MainFrame techniques. Menu & Fkey driven. Index Files, no Dept/Item limit. Select Fiscal Period, Year & CloseOff Passwds, Utility. Update, Inquire/Print current & prior Year/Periods data, Keep Purchase Hist, BB, Cost, Inventory, Sales, Profit%, Turnover%. 9 Reports: PTD, YTD, VendorPO. Write for Free Info. US $495. U.S. Inquiries
PIDATA COMPUTER SYSTEMS
4312 Ontario Street, Dept. M
Vancouver, B.C., Canada V5V 3G9
(604) 876-3145

HATE BOOKKEEPING!
Single entry checkbook accounting system in "C". Emphasis is on simple, fast input. Correcting errors when entered. Audit trail is built into normal use. Allows 999 count codes w/budgets, 99 departments, 99 charge cards, bank reconciliations, prints checks, flexible reporting. Demo $5. Complete $95. Micro-One-Write™
PERMAR & ASSOC.—DEPT. PCM
1125 Sunnyhills Rd.
Oakland, CA 94610
(800) 443-0100 X644

TIME BILLING PROGRAM
For CPAs, attorneys, and any firm billing clients on the basis of time. Billings by flexible client code, job category and worker. Bills can be modified before automatic printing. Clears billed items and carries over unbilled items for next period. PC & compatibles. Best price! $165 by check.
MATHEMATICA PACIFIC, INC.
747 Amana St. #402
Honolulu, HI 96814
(808) 941-9504

SOLID ACCOUNTING PACKAGES
$50 PER PACKAGE
• General Ledger • payroll • Inventory • Accounts Receivable • Accounts Payable
These are professional, proven packages! Requires PC/MS-DOS 2.1 + 128K RAM. Price includes MANUAL but NO SUPPORT! Telephone support available at $30/hr. Above prices are prepaid, shipping included. We accept cash, check or money orders.
MCBS,
12703 Stuebner-Airline #202
Houston, TX 77014
(713) 583-6828

MCBA ACCOUNTING PACKAGES
A/R, A/P, Fixed Assets & Depreciation, G/L & payroll adapted for the IBM PC using MS-DOS. Easy-to-use software for any business & affordable, too! Can be used separately or fully integrated. Complete documentation, installation & support. Over 11,000 installations!
MDM SYSTEMS, INC.
24525 Southfield Road Suite 205
Southfield, MI 48075-2740
(313) 557-1254

SOFTWARE BUSINESS

TIME ACCOUNTING & BILLING
TABS is designed for use by professionals who bill on the basis of time (attorneys, accountants, etc.). User-friendly data entry and menu-driven program selection makes TABS easy to understand and operate. STI's full-feature software is currently in use by over 800 firms nationwide. For details contact:

STI

SOFTWARE TECHNOLOGY, INC.
620 No. 48th, Suite 120
Lincoln, NE 68504
(402) 466-1997

THE SALES MANAGER™
THE SALES MANAGER™ is a professional management information tool for executives in sales, marketing and general business. The system is integrated and handles the tracking and reporting for Customers, Prospects, Sales Representatives, Quota, Commissions, Planning, Forecasting Expenses, Sales Analysis and Personnel. The system easily handles perodic reporting. Importing and Exporting of Files, Linked Records and Multi-leveled Security. THE SALES MANAGER™ is designed to increase sales revenue by allowing the executive control of vital sales information. THE SALES MANAGER™ is easy to use, well documented, flexible, powerful and complete. Price: $575.
MARKET POWER, INC.
11780 Rough and Ready Road
Rough & Ready, CA 95975
(916) 432-1200

LP88—LINEAR PROGRAMMING
A GENERAL-PURPOSE system for solving linear programs with up to 255 constraints and 2255 variables. Features include menu-driven input/output, display editing, double-precision arithmetic, primal and dual solutions, sensitivity analysis, storage problems and bases re-start from a given basis, report generator. Required 128K, 1 disk drive, printer DOS. Recommended 192K, hard or electronic disk. Price: $88 for LP88 and user's guide.
EASTERN SOFTWARE PRODUCTS, INC.
P.O. Box 15328
Alexandria, VA 22309
(703) 360-6942

MILP88-MIXED INTEGER LP
A GENERAL-PURPOSE system for solving mixed integer linear programs with up to 45 integers, 255 constraints and 1255 variables. Solves problems by applying the branch and bound method. Menu-driven with many useful features simiar to LP88. Requires 192K, 1 disc-drive, printer, DOS. $88.
EASTERN SOFTWARE PRODUCTS, INC.
PO BOX 15328
Alexandria, VA 22309
(703) 360-6942

MYTE MYKE™ BUSINESS SYST
COMMERCIAL GRADE INTEGRATED PKG.
• BUSINESS PACK, o/e, p/o, a/r, s/a, a/p, g/l, i/c.
• MFG CTRL. Std cost, bom, oper rtg, fcst-sched, mpp, mrp, sfc, where used, inventory control, production costing.
• PROTIME time and billing
Install and sup avail CP/M, PC DOS, MS DOS, UNIX & more

MDS Associates, INC.
P.O Box 108
Orchard Park, NY 14127
(716) 662-6611

dINVOICER + PLUS
Menu-driven billing & accounts receivable management system Produces Invoices, Aged Statements, Invoice Journals, Receipts Journals, Aged Customer Account Status, Packing lists, etc Available with modifiable source code for dBASE II users $129, or as a stand-alone Run-Time™ package $199 VISA/MC.
DATAMAR SYSTEMS
819 Gage Dr
San Diego, CA 92106
(619) 223-0444

CALENDAR—SAVES TIME
FAST, graphic, effective time management. View year, month, week or day. Edit, copy, insert, delete, search and print time related information. Maintain multiple calendars on a single diskette Store/repeat commands Help Requires PC-DOS 2 0, 128K, Mono or color. Send $85 (check or M O.) for "KGcalendar"
KGourley Enterprises Inc
Dept. MA1
PO Box 180760
Austin, TX 78718

INVESTWARE™
A portfolio management software system offering the investment manager automatic pricing of securities via telecom., comprehensive reports for clients & managers, report generator, interface w/LOTUS 1-2-3, yr-to-date record keeping, tax mgmt., unconfirmed trade monitoring, cross reference reports, 800 hotline #, + numerous.features incl. a word processing interface. Base package $795. & up.
NEMS
345 Whitney Avenue
New Haven, CT 06511
(203) 787-3452

LOTUS WITHOUT FLOPPIES!
Run Lotus 1-2-3 on XT's and compatible fixed hard disk systems without a floppy in the A: drive THE FIX is a manually installed or autoexecutable program that saves wear and tear on your valuable Lotus System disk and loads 1-2-3 faster: $39 95. Lotus 1-2-3 is a trademark of Lotus Development Corporation.
BLUE HERON PUBLISHING CO.
8350 Lincoln Avenue
Skokie, Illinois 60077
(312) 676-1080

LABOR SCHEDULING
EMPLOYEE SCHEDULING SYSTEM is a professional management productivity tool for scheduling up to 150 employees in industries with primarily part-time employees and fluctuating hourly sales (fast food, retail, foodservice, etc.) Reduces labor cost, scheduling time & more. Req. 128K, one 360K disk drive, DOS
MOUNTAINEER COMPUTER SERVICES
Box 258-Ratcliff Bldg
Fort Ashby, WV 26719
(800) 992-9227

SAVE $ ON TELEPHONE COSTS
Increase office efficiency with PHONECHEK. The Telephone Manager for the IBM PC. XT and PCjr Generates summary and detail reports necessary to allocate phone costs to departments, extensions, or to clients for bill back purposes. Discourages phone abuse. Helps determine need for WATS or SPRINT $279
PHONECHEK THE TELEPHONE MANAGER
XIOX CORPORATION (415) 571-7911
411 Borel Avenue, Suite 425
San Mateo, CA 94402

PC ACCOUNTING SYSTEM
Professional Accounting for small business or home use. No codes to forget: all lookups are alphabetic Shows effect of each entry on the screen in English. Supports 20 business units 1000 account codes, and 10,000 customers or vendors Reports by business or consolidated in detail/summarized on screen/printer. Color/mono dual floppy/hard disk $69.95 (VISA/MC/Check/COD/MO) NYS add 7% Tax.
PEGASUS SYSTEMS INC., Dept P
30 Harbour Pointe
Buffalo, NY 14202
(716) 852-2969

STATION MASTER
GAS STATION bookkeeping system is fully integrated. Quick, easy data entry automatically creates complete daily accounting Reports shift check out, TBA, profit & margins. Has full inv control, acct's recv., payroll, P/L stmt., many other features Great vertical mk'tg opptun'ty for dealers
SMALL BUSINESS COMPUTER SYSTEMS, INC
313 Llewellyn Rd
Ambler, PA 19002
(215) 542-9639

DATACARE™/FAST XT BACKUP
New user program lets your XT fly! Backs up a full 10-megabyte hard disk to diskettes in 22 mins—any type/number of files Better verification No more data loss Optimum use of your time and equipment Nothing to learn Works just like your DOS Backup. 30-day unconditional guarantee. $129 00 Visa/MC.
ELLICOTT SOFTWARE, INC.
3777 Plum Hill Court
Ellicott City, Maryland 21043
(301) 465-2690

THE DESK ORGANIZER
Performs 7 desk mgmt functions even while you run other software! Rave reviews. "A gem ... a class act." (PC Magazine) $195 (⅓ off), free enhancements Or try our "Get Acquainted" Kit. $5 00 (refundable). Includes demo disk, brochure, two reports; "Time Management Principles & THE DESK ORGANIZER" AND "Over 75 Uses for THE DESK ORGANIZER" VISA/MC/check
HiTech
Box 803-BL
Menomonee Falls, WI 53051
(414) 274-9229

SOFTWARE BUSINESS OPPORTUNITIES

WRITERS-AUTHORS
Want to write your own microcomputer book? We're looking for writers who want to make money for their hobby Be published by one of the largest, oldest microcomputer book publishers. Obtain your computer needs list or send your own idea by writing to our editorial dept.
TAB BOOKS, INC
Blue Ridge Summit, PA 17214
(717) 794-2191

SOFTWARE BUSINESS PROJECT MANAGEMENT

MicroGANTT
Control your project! You describe the work, MicroGANTT calculates the schedule and budget Time management, resource allocation, project tracking, personnel billing and fixed cost capabilities Flexible critical path charts Unlimited size and scope. PC—DOS, MS—DOS, CP/M—80. Free brochure. Demo available.
EARTH DATA CORPORATION
P.O. Box 13168
Richmond, VA 23225
(804) 231-0300

PRIMAVERA PROJECT PLANNER™
. the most project management you can get from a micro Plan and schedule networks of up to 10,000 activities Level resource use. Control schedule, resources and cost. Call or write to find out why Primavera is used by managers worldwide for improved project performance.
Primavera Systems, Inc.
29 Bala Avenue
Bala Cynwyd, PA 19004
(215) 667-8600

THE AHA! EXPERIENCE
PMS-II, Primavera, Harvard Project Management and Pertmaster Schedules Systems. For managing any complex project-R&D construction, business planning. 2,000-10,000 events on critical path, bar charts, resource managements capacity planning & load leveling. Training also Put profits on the critical path with Aha! The Project Management Software Specialists
Aha! Inc.
109 S. River St.
P.O. Box 8405
Santa Cruz, CA 95061-8405

CRITICAL PATH SCHEDULING
This professional project management system has been proven in 5 years of use on projects totalling over $100M Up to 1,500 activities per network. Simple to learn and easy to use. 120 page manual includes primer on the critical path method system US $495 00 Demo US $50 manual. US $25 U.S. Inquiries.
CANADIAN MICRO SOFTWARE
P.O Box 98 Station J
Toronto, Ontario, Canada M4J-4X8
(416) 694-7597

SOFTWARE CALCULATOR

SUM TEN KEY™
A CPA designed, full featured, ten key calculator. Features include: 24 entry display, 800+ entries in RAM, 9 memory register display with memory stack of 100, memory & entry scrolling & recall, advanced print facilities (with matrix dot parallel printer), disk read/write description & text capabilities, entry editing (automatically changes totals & count), description SEARCH, menu driven by F keys with HELP, dec./float/scien. not., Sub & Grand Totals, K, %, counter, User Manual, plus many other exciting features. IBM PC/XT 192K min., PC-DOS 2 X & disk drive $99 50 (ppd) CK/MO/MC/VISA or call/write for details.
PACECOM SYSTEMS, INC.
PO BOX 1009
Pineville, LA 71361-1009
(318) 640-9001

SOFTWARE COMMUNICATIONS

ELECTRONIX MAIL/TELEX
The POSTMAN enables your PC to send and receive electronic mail and telexes easily and efficiently. This specialized package automatically dials, sends, receives, and logs messages Includes a directory. Uses your own words processor. Designed for Easy-Link and also dials into other services
CAPPCOMM SOFTWARE, INC
1 World Trade Center, Suite 1453
New York, NY 10048
(212) 938-5702

EASY TO LEARN & USE—$95
Ideal for accessing public databases ... DIRECT CONNECT was designed for those with little or no communications experience. Help is accessible from anywhere in the program. Manual written as Tutorial w/Quick Reference section for veterans. Xmodem protocol guarantees accurate data transfer. IBM PC $95

direct·aid

DIRECT AID, INC.
PO Box 4420
Boulder, CO 80306
(303) 442-8080

TELEX LINK SOFTWARE
Link your computer to telex service via ITT, RCA or Western Union with Cawthon's telex software. Designed specifically for telex communications, Cawthon software is easy to use, has on-line help, self-test diagnostics, frequently called numbers, and an excellent User's Guide. Cawthon Software is available for many computers and operating systems.

Cawthon Scientific Group

CAWTHON SCIENTIFIC GROUP
24224 Michigan Avenue
Dearborn, Michigan 48124
(313) 565-4000 Telex: (810) 221-1265

SOFTWARE COMPILER

DeSmet C-$109
Full K & R C Compiler, assembler, linker, librarian, full-screen editor and example software. Both 8087 and floating point libraries. Rated 1st or 2nd in 8/83 BYTE Benchmarks Newsletter. No royalties on generated code. Unlimited updates $20/each. PC/MS DOS and CP/M-86. $109. Now available with source level debugger. Price $159
C-WARE
1607 New Brunswick Ave
Sunnyvale CA 94087
(408) 736-6905

WIZARD C COMPILER
The power of C with the thorough diagnostics of PASCAL. Full LINT diagnostic integrated with compiler. Full UNIX SYSTEM 3 compatibility. Floating point library; fast compact code; 1 register variable. In-line assembly code. UNIX emulation library. Uses MICROSOFT linker. PC/MS DOS 2.0 only. $450.00
WIZARD SYSTEMS SOFTWARE
11 Willow Court
Arlington, MA 02174
(617) 641-2379

LATTICE C COMPILER
Get Version 2.1 of the finest 8086/8088 C compiler directly from Lattice. Includes 8087 support, UNIX math library, FORK/EXEC functions. Compatible with MS-DOS 1 and 2. Single-unit price is $500. VISA/MC accepted. Call for information about corporate licenses and about other Lattice products such as MAKE, GREP, CVUE and WINDOWS.
LATTICE, INC.
PO Box 3072
Glen Ellyn, IL 60138
(312) 858-7950, TWX 910-291-2190

SPARRY BASIC—B COMPILER
Powerful basic compiler that means business.
- Instructions support internal ISAM files.
- Four virtual screens, recall time <1 second.
- Use of all memory for basic programs.
- 13 significant digit integer math package.
- Demos with tutorial and reference manual. Price $159. Quantity discounts.

VISA/MC/CHECK. Mass. res. + 5% tax req. PC DOS with 128K
SPARRY SOFTWARE LABS
PO Box 632 #A
Milford, Mass 01757
(617) 473-5435

C LIBRARY
"THE GREENLEAF FUNCTIONS" for CI-C86, Lattice, Microsoft, Mark Williams or DeSmet C. Includes DOS 2.0, strings, printer, colortext, video, function keys, Async, lots more. With 220 page manual, examples, source codes, demos. Specify compiler. $175 + $7 shipping. Check, MC, VISA. THE MOST EXTENSIVE C LIBRARY ANYWHERE.
GREENLEAF SOFTWARE
2101 Hickory Dr
Carrollton, TX 75006
(214) 446-8641

SOFTWARE DATA MANAGEMENT

FORM MANAGER
COMBINES data entry, data base forms processing, and spreadsheets. Design forms on screen. Use them for data entry retrieval & calculations. Does data entry validation. Report writer sorts any 3 fields. Prints labels, reports, based on your own criteria. Handles up to 32,767 records. $195. Demo disk-$15.00.
BIT SOFTWARE
PO Box 619
Milpitas, CA 95035
(408) 262-1054

PC-FILE III
A "top-ten" winner (SOFTALK mag. survey). Version 2.0 (a major enhancement) includes full-screen data entry, a "browse" mode, global update & delete. Extremely fast & easy to use. Exchange data with 1-2-3, WORD, WordStar, etc. $49 check, M/C or VISA.
ButtonWare
PO Box 5786
Bellevue, WA 98006
(206) 746-4296

BEAST 2.0 ENHANCED
Recently enhanced, still easy to use. The BEAST now supports duplicate keys and a powerful Browse capability. All fields are searchable during maintenance, using full, partial or embedded values. Find out why the experts now rate the BEAST as an excellent buy. $65.00. DOS 96K. Sample $5
STANTON SOFTWARE
PO Box 173
Stanton, NJ 08885
(201) 236-6842

FOR STUDENTS, RESEARCHERS, PUBLIC SPEAKERS
BIBLIOG is a menu-driven system that tracks information by topic (main, topic + 2 sub-topics), author, publication & article title. Information may be obtained on screen or through printed reports at the user's option. Especially written for the IBM PC. Price $65.00
MICRO-DYNAMICS OF TEXAS
PO Box 40691
Houston, TX 77240
(713) 937-9535

SOFTWARE DENTAL

DentalWare™
PROVEN Dental Management System—in use 4 yrs. Patient data management, A/R, statements, insurance forms, practice analysis, word processing, recall, delinquent processing, historical data. FLEXIBLE. User designed forms, notices, statements, reports. $3600. Training included. Dealer inquiries invited.
DATA STRATEGIES, INC.
332 S. Juniper St., Suite 210
Escondido, CA 92025
(619) 489-9218

SOFTWARE DEVELOPMENT TOOLS

CROSS-ASSEMBLERS
Use your desktop computer as a development system with Avocet assemblers—the industry standard since 1980. Available for CP/M-80, CP/M-86, and PCDOS/MSDOS host systems, in most popular disk formats. Target chip families 6805, 6809, 1802/05, 8048, 8051, 6502, 6800, NEC7500, F8, Z8, COP400, 8085, Z80. $200 to $500.

AVOCET SYSTEMS INC.

AVOCET SYSTEMS, INC.
804-P South State St
Dover, DE 19901
(800) 448-8500, (302) 734-0151

PASCAL AND C TOOLS
TOOLS includes full string use, screen handling, graphics, & a general BIOS gate. TOOLS2 supports all DOS 2.0 functions, including program chaining. VIEW MANAGER screens are painted with a Screen Painter & stored in the Screen Database. Source code is provided. TOOLS $125, TOOLS2 $100, VIEW MANAGER $275.
BLAISE COMPUTING, INC.
2034 Blake Street
Berkeley, CA 94704
(415) 540-5441

CROSS ASSEMBLERS
The same manufacturer—compatible, relocatable cross—assemblers Microtec has been providing to professional developers since 1974 are available to transform your PC/MS-DOS host microcomputer into a development system. Loaders/communication utilities included. Target families: 80186, 8096, 8085, 8051, 8048, 68000, 6809, 6800, Z80, 6500, others.

MICROTEC RESEARCH

MICRO-TECH RESEARCH, INC.
PO Box 60337
Sunnyvale, CA 94088
(408) 733-2919

COLOR AND CURSOR CONTROL
in text mode (screen: 25X80) for most compilers: 64K, 128K and full memory, e.g., MBBasic, MS & IBM/FORTRAN, etc. Reverse typed & lots more! Compatible with MS/DOS 1.25 & 2.1, PC/DOS 1.1 & up! Write for more information. Make those expensive compilers useful. BARTSUBS ($47) links with your code.
BARTSOFT
3210 Lake Shore Boulevard
Wayzata, MN 55391
(612) 473-4032

BASIC DEVELOPMENT TOOLS
Increase your BASIC programming productivity with these preprocessors, filters, and utilities. All programs run from DOS level. All except NUMBER and LABEL work with binary format files! No need to save in ASCII.
- NUMBER programs written with your text editor using labels
- LABEL programs written using line numbers. Identify entry points
- CROSS REFERENCE variables, line references, and Basic reserved words
- SMASH programs to smallest space. Removes remarks and extra spaces
- COMPARE two Basic programs, documenting differences line-by-line.
- MERGE with delete. Combines two program fragments in line number order
- LIST up to 20 programs with page headings and numbers without operator intervention

Send $100 for complete kit, including manual and application notes, or write for info.
Datasmith, Inc.
Box 8036
Shawnee Mission, KS 66208
Phone: (913) 381-9118

C UTILITY LIBRARY
Don't reinvent the wheel Save time and do a better job developing your software Extensive library with source. Best color/mono screen handling available. Windows, graphics, DOS 2 directories and files, keys, printer, communications, date, time, and more Over 200 functions DOS/BIOS gate gives you complete control of your PC. Thorough manual with examples. C86, Microsoft, Lattice. List $149 Intro offer until 10/31 $79 Demo $30
ESSENTIAL SOFTWARE, INC.
Box 1003
Maplewood, NJ 07040
(914) 762-6605

BASIC B-TREE SUBROUTINES
CADSAM is a B-tree keyed file access system. A set of subroutines you merge with your program. Supplied in BASIC source code. Use interpreted or compiled. Files never need sorting. Random search time 1 second. No royalty charge. Compatible accounting programs available Price $150. VISA/MC accepted
CADS, INC
PO BOX 17304
Greenville, SC 29606
(803) 297-0651

SOFTWARE EDIT

KEDIT
KEDIT is an XEDIT-like full screen editor for the PC. Features include split-screen editing of multiple files, targets. ARBCHAR, SCHANGE, GETFILE, SORT, paragraph reformatting, wordwrap, block operations, & key redefinition Needs 80 column display 128K (160K with DOS2), $95 ($125 AFT 10/1/84) plus $3 shipping Demo version $10
MANSFIELD SOFTWARE GROUP
P.O. Box 532
Storrs, CT 06268
(203) 429-8402

SOFTWARE EDUCATIONAL

THE RESEARCH ASSISTANT
Easy-to-use literature filing system for PC/XT. Stores complete reference, user-defined subject/keyword headings, and 250-word abstract Will search for ANY word or phrase in ref or abstract Compiles & prints reference lists & annotated bibliographies Interfaces with most w.p. software Reqs 64k two 320K dd. $50 U.S. Inquiries
Hi-Q Microware
#8—13322 102A Avenue
Surrey, B.C. Canada V3T 5J7
(604) 585-1629

THE FUTURE IS NOW
MOTHER GOOSE—New generation revolutionary software for young children. Brilliant color graphics, animation and lively music. Instills computer & reading skills & is child proof Electronic page turning allows your child to experience the wonders of Mother Goose It's fun, IBM PC/XT & PCjr, $34 95, VISA/MC.
SUNSTAR SYSTEMS
Route #4, Box 368
Ogdensburg, NY 13669
(315) 393-7117

THE RESEARCH ASSISTANT
Easy-to-use literature filing system for PC/XT. Stores complete reference, user-defined subject/keyword headings, and 250-word abstract. Will search for ANY word or phrase in ref or abstract Compiles & prints reference lists & annotated bibliographies Interfaces with most w.p. software Reqs. 64k two 320K dd. $50. U.S. Inquiries
Hi-Q Microware
#8—13322 102A Avenue
Surrey, B.C. Canada V3T 5J7
(604) 585-1629 c266

SOFTWARE ENGINEERING

TECHNICAL SOFTWARE
Largest selection of engineering software—CAD, Heat & Mass Flow, structural, Statistical Analysis and much more Microcomputer programs for Mechanical, Chemical, Civil, Electrical Engineers, Architects, Scientists, Contractors. Send for detailed catalog—Include $2.00 for postage and handling
TECHNICAL SOFTWARE INC.
3981 Lancaster Rd., #101
Cleveland, OH 44121

ENGINEERING PROGRAMS
PSI is the foremost producer of serious engineering applications for the PC. PAKS available handle chemical, mechanical, civil and power design & analysis problems Our catalog is growing daily Call or write for your free copy See review PC Magazine, Nov 1983, page 567.
PSI/SYSTEMS
Research Park, P.O. Box 3100
Andover, MA 01810
(617) 475-9030

STRUCTURAL DESIGN
Quick, versatile, interactive structural programs—beams, columns & frames of any material efficiently analyzed & designed Extremely friendly input & output with optional COLOR graphics Specify PC configuration and send $25 for demonstration disk to:
c^2b^2—software design
763 27th Avenue
San Francisco, CA 94121
(415) 751-1337

smARTWORK™
Printed-circuit artwork editor for double-sided boards up to 10" by 16", runs on an IBM-PC. Color display allows complete interactive control over the placement and routing process. 2X artwork can be made on a dot-matrix printer or pen-and-ink plotter $895. Write or call for a brochure.

WINTEK

WINTEK Corporation
1801 South Street
Lafayette, IN 47904-2993
(317) 742-8428

PC ENHANCEMENT HANDBOOK
THE IBM PC ENHANCEMENT for SCIENTISTS & ENGINEERS. A How-To-Handbook with answers to all of your questions on PC enhancement What can be done? How to do it? and how much will it cost? Includes Toll Free Hotline for application assistance & convenient one stop shopping SPECIAL INTRODUCTORY OFFER $18 95
CyberResearch, Inc.
P.O Box 9565
New Haven, CT 06536
(800) 341-2525; (203) 436-2600 (CT)

SIMULATION
GPSS/PC is a full-power version of GPSS, the most popular mainframe simulation language. More than just a language, it is a simulation environment specifically designed for interactive use on today's high-speed microprocessors. Using GPSS/PC, you can predict effects of changes to real-world systems $900.
MINUTEMAN SOFTWARE
P.O Box 171/B
Stow, Massachusetts 01775-0171
1-(800) 343-0664 ext. 4800 (U.S.),
1-(800) 322-1238 ext 4800 (Mass. only)

OPTISOLVE
Optisolve solves nonlinear systems of equations and maximizes or minimizes nonlinear functions with nonlinear constraints It has the capability to find all solutions, including complex ones No programming language is required, the user simply inputs the problem directly in terms of symbolic equations and inequalities No other package is as powerful $195.
OPTISOFT
1445 Crone Ave.
Anaheim, CA 92802

SOFTWARE FINANCIAL

COMMERCIAL CREDIT ANALYSIS
CLDS is a tool used by credit analysis and loan officers to help improve the quality of analysis and better quantify the lending risk. It is menu driven and generates common-sized statements, ratios, funds flow, RMA comparisons, projections, trends and graphs Monthly and Quarterly input formats an dprojections, also available Basic Model $1,800; Monthly $650; Quarterly $650
BAKER HILL & COMPANY
9085 E Mineral Circle, Suite 210
Englewood, CO 80112
(303) 799-0238

CASH FLOW MANAGEMENT
LOOK takes all the what-if power of LOTUS 1-2-3™ and allows the executive to solve problems without programming his computer. It is menu driven and generates common-sized financial statements, ratios, cash flow, trend reports and graphs. Tactical and strategic planning is the focus of LOOK Dollar and or percentage variables are changed to generate proformas for 5 years or 12 months $950
BAKER HILL & COMPANY
9085 E Mineral Circle, Suite 210
Englewood, CO 80112
(303) 799-0238

DEPRECIATION-MASTER V2.0
Data base system for assets & depreciation schedules, inc. all IRS pub 534 methods, ACRS schedules supplied on disk. Allows for multiple methods per asset to handle book & tax acctg. Allows for fiscal yr. Generates tax form 4562 output (1983 format). Several other reports inc Req. 2 drives, DOS, BASIC $199 Call or Write:
Generic Software
P.O Box 790, Dept 984C
Marquette, MI 49855
(906) 249-9801

CORPORATE CREDIT ANALYSIS
EURAMICRO™ is a microcomputer based corporate analysis system—fulfills all corporate analysis needs of financial institutions including historical comparison, & forecast reporting using your own data Also allows through time sharing or diskette access to EURABANK™—Non U S data as well as FDIC & corporate data. Formats are available to cover 12 industries.
Eurastar Division—SLEIGH CORPORATION
P.O Box 591
Franklin Lakes, NJ 07417
(201) 891-7528

PRICE STOCKS WITH LOTUS
New financial template developed in business school uses Lotus 1-2-3 to price GNMAs, FNMAs, stocks, bonds, options, T-bonds and T-bills, futures contracts & calculate bond duration This template is a must for investors who use an IBM-PC or XT. Includes disk & instructions Send $75 00 (NC residents add 4 5% tax) to
BRANYON ENTERPRISES
Post Office Box 3466, Dept S
Chapel Hill, NC 27515
(919) 967-4047

RORY TYCOON
Portfolio Manager for small investors with big ideas and big investors with small computers Track stocks, options, CDs, IRAs, cash, bonds (zeros also), metals, mutual funds, and futures. Spreadsheet compares net worth, profit or loss, yield, asset distribution, etc. $24.95 (Texas + tax). Requires Lotus 123
Coherent Software Systems
311 W. 21st Street
Houston, TX 77008
(713) 869-0465

INVESTMENT MASTER/PC
A sophisticated Investment Management program designed for the IBM PC, PCXT and PCjr. Track 2,000 different stocks and can be used for other investments as well Calculates net return, prints or displays reports, converts investment information for use with spreadsheets and more. Price is $129, sample disk is $9 (credit with purchase) Requires 64K, 1 disk drive, 80 column display and printer.
ALRO COMPUTER SOFTWARE SERVICES
P.O Box 927
Jackson, MI 49204
(517) 787-2204

PERSONAL MONEY MANAGER
A powerful personal financial management system featuring Menu driven, Automatic budgeting; Computer-aided instructions, Unlimited number of checking and budget accounts; Credit card, Teller machine, Ad Hoc reporting, and many more. Complete $195; if you own dBASE II™ $115; Demo package $25.
BOWLING, ROEBUCK AND COMPANY
Dept B1
3236 Holly Berry Court
Falls Church, VA 22042

SOFTWARE
GAMES

ATTENTION: FOOTBALL FANS
Ark Software presents "QUARTERBACK SACK". A realistic football simulation for the avid fan, as well as the novice Just look at what this challenging and exciting game features
Ability to play the computer or an opponent.
- Fumbles, interceptions, on-side kicks, sacks
- Statistics, real-time clock, coin-toss, sounds.
- Graphical ball movement, passing, field goals
- 19 offensive plays/9 defensive plays.
- Full documentation, and much more!

Requires PCDOS, 64K, Mono or RGB Price $29 95.
ARK SOFTWARE
1404 Lowden
Mt Prospect, IL 60056
(312) 296-5446

R . . . L . . . . N
Letter by letter the puzzle is revealed. R . . . L T . N. Over 140 categories. Music, Entertainment, Sports, Quotations, General Knowledge R . V. L . T N. One or two can play R . V . L A T N Solved it yet? 3000 more per game. Sure to challenge even the best Requires 64K, 1 Disk Drive, PC-DOS R . V . L A T I O N I and II $20.95 each
ACORN SOFTWARE ENGINEERING, INC.
1701 South Princeton L
Ottawa, Kansas 66067
(913) 242-7360

BRIDGE/CRIBBAGE SOLITAIRE
Watch, learn or play BRIDGE AND CRIBBAGE. Hands may be random, repeated or input. Scoring is automatic. Both programs will play duplicate and give insight into their play on request. Runs on any PC or Jr Comes in both b/w and color Great for Xmas Just mail $35-CRIBBAGE: $40-BRIDGE; $55-BOTH (+ $5 for CDN funds) to:
DEALERS CHOICE SOFTWARE
PO Box 332, Station C
Kitchener, Ontario N2G 3Y9
(519) 884-1629

EXECUTIVE ENTERTAINMENT
MINDSKILL-UNIQUE CHALLENGING INTRIGUING
MINDSKILL-Suitable for Office/Executive Desk
MINDSKILL-4 Puzzles, Progressive Complexity
MINDSKILL-8 Fascinating Designs, Animated Moves
MINDSKILL-AUTO Solve is Entertaining to watch
MINDSKILL-SAVE, LOAD; Quick Break to spreadsheet Min Req. PC/XT/jr, DOS II, 64K, IDS drive, Clrboard Clr or Grn Mon Send $49.95 CK/MO, CT Res. + 7.5%

mindskill™

MINDSKILL DEVELOPMENT CORP.
PO Box 13
Stratford, CT 06497

BACKGAMMON
Our popular Backgam 1™ lets you challenge the computer to a great game of backgammon whether beginner or advanced Game allows for several different levels of ability Improve skills or just have fun For IBM PC, XT, Compaq or compatible Send $39.95 Check, MO, VISA/MC or call for dealer near you Requires 64K, any version DOS, 80 col monochrome or color disp.
Sears Electronics Inc.
Tirrell Hill
Goffstown, NH 03045
(603) 497-3074

SOFTWARE
GENERAL

BAR CODE GENERATION SW
Create BAR CODE labels with Old 84, 92, 93. Epson X Trilog printers Interactive pack. Prints 39, 93, 12 of 5, 2 of 5, Codabar & UPC-A symbologies on 1-3 up label stock Inc./Dec OCR interpretation—meets LOGMARS reqmts. CPM-86, PCDOS—for IBM PC/XT, CDP MPC, other compatibles $300 Dealer pricing available.
DATAFLOW TECHNOLOGIES, INC.
8422 Bellona La , Suite 303
Towson, MD 21204
(301) 296-2632/666-2366

PRINTER BASHER™
Get full menu-based operation of ALL control functions of ALL of the Epson MX, FX and RX printers with the PRINTER BASHER™ Also downloads to the FX the three COMPLETE 255-character IBM sets, including block and line graphics, greek symbols, etc Scores of different print styles, and a few keystrokes does it all For the IBM-PC, Apple IIe and Epson QX-10 computers Visa, MC, COD $59 95 Free info Dealers welcome.

PRINTER Basher™

CONNECTICUT SOFTWARE
30 Wilson Avenue
Rowayton, CT 06853
203-838-1844

PC. DATEBOOK/CALENDAR
Full featured Personal DATEBOOK, CALENDAR & ADDRESS LIST organizes your hectic family or business schedule Display & prints monthly calendar with daily events and appointments. Maintains, searches and displays your address list too! Fast and easy to use Only $29 95 Prompt shipment VISA, MASTER, check or COD
LATERAL PROGRAMMING, INCORPORATED
Altamonte Springs
Florida 32701-0337
(305) 788-1433

DVORAK KEYBOARD SOFTWARE
Want a Dvorak Keyboard for your IBM PC? Sure-Stroke translates keystrokes, gives you Dvorak Typing Coach, transfer letters for key tops, manual, self-motivation audio cassette Works with Lotus, dBase, WordStar, etc Stop hunting and pecking—Stroke the Dvorak today! $95 00 plus $4 00 shipping, Visa/MC AMEX or check.
SEASONED SYSTEMS, INC.
Box 3720
Chapel Hill, NC 27515
(800) 334-5531 (919) 967-5818

LARGO SOFT INTERNATIONAL
ARGOSPACK—The Industrial/Mechanical engineering pack. HIGHCAD—The complete highway + construction CAD system. THERMAX—The printed circuits board heat transfer CAD system for Milspecs designers IDP—The complete 2½ D drafting system STARNET—The powerful project Management system. PC-MAPICS—Systems 34 IBM Mapics compatible SEE US AT COMDEX—BOOTH #6643
LARGO SOFT INTERNATIONAL
Hameasfim St
Tel Aviv, Israel 64736
03-250918/250919 Telex 35301, Largo, IL

"PLAY THE HORSES"
A scientifically derived system for handicapping thoroughbred races Many factors analyzed, ten found to be vital in determining winners See POPULAR COMPUTING, Feb 1984 for review Simple to use Obtain "Daily Racing Form", and answer ten questions on each horse. Computer will print out the odds $29 95
3G Company, Inc
Rt #3, Box 28A
Gaston, OR 97119
(503) 357-5607

RENT PUBLIC DOMAIN SOFT/W
Rent our PC Disk Libraries for 7 days and copy them yourself Hundreds of useful business, games and utilities FREE FOR THE TAKING!

IBM-PC SIG-Volumes 1-200	$200 00
IBM-PC "BLUE" 1-59	$65 00

Rental is for 7 days after receipt, 3 days grace to return Most credit cards accepted
NATIONAL PUBLIC DOMAIN
SOFTWARE CENTER
1533 Avohill Drive
Vista, CA 92083
(619) 941-0925 Info (619) 727-1015 24 hr. orders

YOU NEED NEVER MISS
Another important date The program can be initiated by AUTOEXEC BAT (or run separately) To search your "custom" calendar and display current items each time the system is booted The program permits adds, deletes, and changes to the calendar file MEM-JOG™ is valuepacked. Req 1-disk $24 95
DAFER ENTERPRISES
PO Box 2336
Baltimore, MD 21203
(301) 433-3904

CHURCH ADMINISTRATION
COMPUCHURCH™ Unequaled Excellence At Low Cost Superb Software For ALL Of Your Church Admin Congregation Mgt , Contribution Mgt , Ledger & Word Processing Available For Most Micros—Including IBM PC, DEC Rainbow, Radio Shack III/IV, Tandy 2000, Corona, Sanyo and Zenith Hardware Available Dealer Inquiries Invited
MICROCOMPUTER TECHNOLOGY
& SOFTWARE, INC
312 Government Street—PO Box 596
Niceville, Florida 32578
(904) 678-3328

PUBLIC DOMAIN SOFTWARE

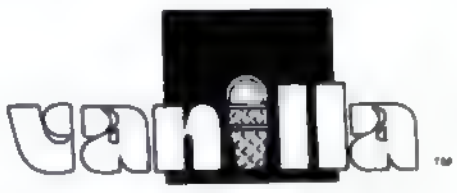
Our Users Group Library can help you get more from your PC or PCjr! Choose from these software packages.

- NEW PC or PCjr. USER-3-disc starter set. $25.
- PC SIX-PAC-Six discs containing a wide variety of useful software. $49
- SAMPLER-one get-acquainted disk. $10.

Send in your order today (please include $2 for shipping & handling). Catalog included.
CENTRAL CALIFORNIA USERS GROUP
PO Box 8140
Santa Cruz, CA 95061

DISKETTE COOKBOOK SERIES

ATTENTION GOURMET COOKS! VANILLA is redefining the meaning of software publishing. We publish the most comprehensive library of diskette cookbooks available. Search, scale and print recipes from the thousands available in the Series cookbooks. Powerful, yet simple, no user manual needed. Software $40; cookbooks $12-16 each. Send for free catalog.



VANILLA SOFTWARE
3345 Lakeshore Avenue, Dept. B
Oakland, CA 94610

IBM COMPATIBLE SOFTWARE

Save 80 to 90% off retailer's markup on a large selection of popular IBM compatible software. Titles such as VOLKSWRITER, DBASE, MULTIMATE, DOLLARS & SENSE and much more. Next day shipping of in-stock items. Call for up-to-date prices. MC/VISA/COD/MO/CHECK.
STRICTLY SOFTWARE, Inc.
4201 Cathedral Ave. NW Suite 911E
Washington, DC 20016,
(202) 537-1010

SHOP CHEAP—EAT SMART

- COUPONOMIZER—Save more money with your discount coupons and rebates. 64K.
- DIET ANALYZER—Perfect for weight control, menu planning and special diets. 128K. $49.95 ea. + $2.50 s/h. Requires 1 diskette drive, 80 column display and printer. Immediate shipment, 2 week money back trial. A/E, M/C, VISA.

NATURAL SOFTWARE, LTD.
7 Lake St. STE 7E
White Plains, NY 10603
(800) 626-2511, (914) 761-9329 in NY (collect)

SOFTWARE GRAPHICS

35mm SLIDE FROM YOUR PC

COMPUTER SLIDE EXPRESS converts graphic files produced on the IBM PC into brilliant 35mm color slides with color resolution 400% better than your monitor. Leave your printouts behind. Use high resolution color slides at your next presentation. COMPUTER SLIDE EXPRESS $6/slide $30 minimum order.
VISUAL HORIZONS
180 Metro Park
Rochester, NY 14623
(716) 424-5300

HALO™

Graphics subroutines that run under MS/DOS in PASCAL, C, ASSEMBLER, FORTRAN, BASIC, and APL+. Supports color & monochrome graphics devices & can be graphics interface to applications. Lines, arcs, circles, dithering, patterns, etc. can be created. World coordinates, fonts, image compression & animation features Inc
MEDIA CYBERNETICS, INC.
7050 Carroll Ave
Tacoma Park, MD 20912
(301) 270-0240

GRAPHIC PRINTER SUPPORT

At last IBM-PC graphic character support for your dot matrix printer. Use the PrtSc key to produce quality scaled dot matrix reproductions of your display on your Epson, IBM, Okidata, IDS, Centronics, DEC, Anadex, Datasouth, Gemini, TI 850, Riteman, Toshiba, NEC 8023, or C. Itoh printers. If your printer is not listed, let us know and we will support it. GRAFPLUS is now available for all versions of PC or MS-DOS and will operate with IBM and Hercules graphics boards as well as the IBM monochrome. $49.95.
JEWELL ENERGY TECHNOLOGY
4451-53rd Avenue Southwest
Seattle, Washington 98116
(206) 937-1081, (214) 245-7387

FORTRAN/PASCAL GRAPHICS

70 MicroSoft FORTRAN/PASCAL (3.1, 3.2), IBM (2.0) or SuperSoft FORTRAN callable subroutines. Professional graphics power backed by a 100 page user manual, filled with examples and designed to be useful to every level of user. Five packages in one! General utility, 2—D interactive, 2—D plots, 3—D plots, and solid models (hidden line removal!) $135.00.
MICROCOMPATIBLES
11443 Oak Leaf Drive
Silver Spring, MD 20901
(301) 593-0683

ARTPAK™ DRAWING/ANIMATION

Create exciting & colorful animation for store displays, cartoons, educational shows & demos using ARTPAK. Make a bird fly! Or a man jump! Incl. a complete drawing board, probably the easiest to use graphics program available. Many special effects. You can even add music! 128K/C.G. crd $99. Ask about color printing. See our full page ad this issue.
PalSoftware Corporation
6100 Barrows Dr
Los Angeles, CA 90048
(213) 259-9659

ZEBRA BUSINESS GRAPHICS

Create graphics for display on your Epson printer. No color card required! Zebra is menu-driven, and with default settings and automatic labeling you can quickly make line, bar, pie and text charts. Customize your graph to your data—choose hatching, labeling, 3D, layout. Reads data from Lotus, Visicalc, Multiplan, ASCII, as well as from the keyboard. Color systems can view graphs on RGB monitors. $125, VISA/MC.
IMRS Inc., Dept PC-1
11 High Ridge Road
Stamford, CT 06905
(203) 359-9655

FONTS + PICTURE LIBRARIES

FONTPAK—med res graphics PC fonts. 16 fonts per set 8×8 & 16×16 pixels per char. BASIC routines. SET I/SET II $39.95 ea. PICTUREPAK-image library sets: MAPS, FINANCE, PEOPLE, WORDS, BUILDINGS. BASIC routines for display $49.95 ea. SOFTSLIDE presentation system—CALL
RUBIN SYSTEMS INC.
15 Blackberry Drive East
Stamford, CT 06903
(203) 322-2647

EXECUTIVE PICTURE SHOW

For IBM PC and Compaq: the complete presentation graphics package. Easily the most powerful and distinctive package of its kind; with its ability to create presentations using literally hundreds of animated drawings, graphs, etc. Ideal for slides, displays, hard copies. Retail $245.

EXECUTIVE PICTURE SHOW

PCsoftware
9120 Gramercy Drive
Suite 416
San Diego, CA 92123

SOFTWARE HEALTH

FREE DEMO DISKETTE!

Turn your computer into a valuable ally in achieving perfect fitness and permanent weight control. Order demo diskette for only $6.00 and deduct this from the purchase price of $69.95 when ordering the Master Control Diet and Exercise Program, PCjr version now available (128k, 80 column monitor).

HEALTHWARE
1504 Leander Rd.
Georgetown, TX 78626
(512) 863-6910

SOFTWARE HOBBIES

ASTROLOGY SOFTWARE

We have everything from high-accuracy calculation packages for professional astrologers to programs that print multipage natal, forecast, relationship and numerology interpretations for everyone. These interpretation programs include a license to sell the copyrighted text output.
AGS SOFTWARE
BOX 28, Dept C
Orleans, MA 02653
(617) 255-0510

THE GARDENER'S ASSISTANT

Have your IBM PC or PCjr layout your garden, and suggest plant/harvest dates and quantities to buy and plant. Select from over 50 vegetables or add your own. Garden layout is produced on your screen where you may use commands to modify the layout. Optional printer output. Garden(s) may be saved to disk. IBM PC and PCjr with one disk drive $45.00. (Also available for Apple II series and C-64).
SHANNON SOFTWARE, LTD
PO Box 6126
Falls Church, VA 22046
(703) 573-9274

STAMP COLLECTORS

The Philatelic Management System is superior software for every level of collector. Covers every aspect of collection management. Inventory Module now available and upgradeable to complete system. IBM PC, Apple IIe and III. Complete system, $295, Inventory Module $159. Demo package $15, credited to final purchase.
SOFTSTYLE, INC.
7192 Kalanianaole Hwy., Suite 205
Honolulu, HI 96825
1(808) 367-5600

SOFTWARE INFORMATION MANAGEMENT

KWIC-REF/1

A general purpose text filing system. It is designed to file and cross reference documents, notes, letters and any text materials. It can keep track of up to 32,000 key words and 32,000 documents using "and" "or" and "xor" combinations $300
CHEN INFORMATION SYSTEMS, INC.
1499 Bayshore Blvd, Suite 205
Burlingame, CA 94010
(415) 692-4358

SOFTWARE INSURANCE

THE AGENCY MANAGER™
Designed by insurance professionals for independent insurance agents, this integrated system performs Customer acctg., general ledger, client data update and retrieval, over 100 marketing reports and sales tools, ACORD's. Easy main menu and HELP feature IVANS IBM-PC, CP/M, Turbodos
APPLIED SYSTEMS
Pauling Rd
Monee, IL 60449
(312) 534-5575

WARNING!
Your disks may be in danger! Check your blank, business and game disks. If they do not have a plastic or paper ring around the center hub, disk and or data loss can occur DISKLIFE is now offering to the public, 30 rings with applicator for only $27 95 (5¼"), $32.95 (8") Don't loose your data! Cal Res. add 6 5% tax.
DISKLIFE
165-G Cristich Lane
Campbell, CA 95008
(408) 559-3302

SOFTWARE LANGUAGES

FORTH-32
The most complete language available for the PC. Comprehensive 420 page manual Complete interface to DOS and BIOS, including graphics, video interface, parallel and serial ports, light pen, joy-stick, sound, color, DOS file access. Double screen editor The only full FORTH 8088 Assembler See our ad this issue
QUEST RESEARCH, INC
303 Williams Ave
Huntsville, AL 35801
(800) 558-8088 or (205) 533-9405

MATRIX 100
Powerful Matrix operations with single statements in IBM PC BASIC. Perform multiple regression, solve simultaneous equations, invert matrices, etc. MATRIX 100 commands are fast, reliable and easy to use
Requires 128K. Price $80 00 (or send $7.50 for demo disk-includes all commands.)
STANFORD BUSINESS SOFTWARE, INC.
4151 Middlefield Rd., Suite 215
Palo Alto, CA 94303
(415) 424-9499

PASCAL-FOR THE PC: EXAMPLES-PLUS
Jato Inc. Now offers a diskette with over 300 K bytes of useful info about IBM Pascal More than 65 sample programs. Save time and effort, we have found the problems and documented the solutions Send $30 00 for diskette (Ca add 6%) or $3.00 (refund with order) for complete description to:
Jato Inc
24861 Alicia Parkway, Suite 272-B
Laguna Hills, Ca 92653

COMPATIBLE LANGUAGES
C, Pascal and Multi-Basic compilers generate compatible object code so languages can be mixed. C is full K&R, Pascal is full Jensen & Wirth + extensions and Multi-Basic compiles both MBASIC and CBASIC. $139 each. Available for PCDOS, MSDOS, CPM80; TRSDOS on Models I, II, III, 4, 12 Send for free brochures.
ALCOR SYSTEMS
13534 Preston Rd., Suite 365
Dallas, Texas 75240
(214) 494-1316

STRUCTURED BASIC! $39.90!
Rational Basic eliminates all line numbers, enforces structured programming, and provides named subroutines in Basic/Basica programs Comes with editor and profiler 2000 source lines on disk + 120p book! If you write Basicc programs or teach programming, Ratbas is a must. NY residents add 7%. Inquires welcome.
BRAIN SOFTWARE SYSTEMS
P.O. Box 1671
Troy, NY 12181
(518) 272-8835

SOFTWARE LEGAL

LAWSEARCH-WESTLAW
Access the WESTLAW legal database using an IBM PC/PC-XT or compatible Certified and recommended by West Publishing Co. for their WESTLAW subscribers using PCs. Easy to learn & use: Log-on automatically w/one keystroke. Save information to disk or printer Convert files for use with most wordprocessors. $350.

DIRECT AID, INC
PO Box 4420
Boulder, CO 80306
(303) 442-8080

SOFTWARE MAILING PROGRAM

MY-T-MAILER™ $30
Our users love this sturdy menu-driven worker. Secretaries say "Terrific!". Print labels, 3x5 cards, envelopes, any format. Customize labels with line-by-line printer fonts. Sort, Search & Select with powerful, flexible, easy user-interface Print up to 5000 copies of one label. Req. 128K, DOS, parallel printer, 80 col $30
JOHNSON SOFTWARE COMPANY
Suite 195-C
420 Pier Avenue
Hermosa Beach, CA 90254

FOR EVERYONE
INNERVISIONS MAILER: A powerful mailing system for labels, form letters, and directories. Multi-level sort/select. $49.00
ELECTRAFILE: A user-defined list manager, letter merger. Imports & exports ASCII file. Functions too numerous to list here $99.
INNERVISION MICROSYSTEMS, INC.
PO Box 3427
Silver Spring, MD 20901-0427
(301) 445-2493

SOFTWARE MANUFACTURING

QUALITY CONTROL
QUALITY ALERT™—Diagnose and correct quality problems with ease. Descriptive statistics • Histograms • Control Charts • Process Capability • Variable/Attribute Data Samples • Graphic and Printer Output • User Friendly • Menudriven • Complete Documentation • Support • Apple, IBM PC & XT compatible. Money back guarantee, $795 00
PENTON SOFTWARE, INC.
420 Lexington Ave./Suite 2846
NY, NY 10017
(212) 878-9600, 1-(800) 221-3414

MCBA MANUFACTURING SYSTEM
Adapted for the IBM PC using MS-DOS. Inventory Management, Bill of Materials, Order Processing, Purchasing, Job Costing, MRP, Labor Performance, Shop Floor Control, Standard Product, Costing and Routing, Accounting. Install & support available. In use at over 11,000 installations!!!
MDM Systems, Inc.
24525 Southfield Rd. Suite 205
Southfield MI 48075
(313) 557-1254

MYTE MYKE™ MANUFACTURING
CONTROL SYSTEM integrates with BUSINESS SYST & features mainframe capabilities. STD COST ... bill of matl and operations routing provide where used, same as except, & projection capabilities. FORECAST/SCHED, MRP, MPP, Production costing, SHOP FLOOR CTRL. Install & support avail CP/M, PC DOS, MS DOS, UNIX & more.

MDS ASSOCIATES, INC.
P.O. Box 108
Orchard Park, NY 14127
(716) 662-6621

TWIN OAKS mrp2

• Bills/material	• 22 Modules
• Inv Control	• 128 PC or XT
• Purchasing	• DOS 1.1 or 2.0
• MRP & CRP	• Hard/Soft Disk
• Master Sched'g	• Online—Realtime
• Phys inventory	• Multi User
• Std Costing	• Acctg interface

TWIN OAKS, INC.
Box 136
Cottage Grove MN 55016
(612) 458-1604

MFG. CONTROL SYSTEMS (MCS)
A Comprehensive system for repetitive or job shop type manufacturers consisting of: B/M, Inventory, Order Processing, Purchasing, Mat Req. Planning MRP, MPS, Shop Floor Ctrl & CRP, Cost devel., Job & W/O Costing, Accounting. 1 Yr. warranty included Train & consult avail Compare our system & prices for best value.
PRODUCTION SYSTEMS INC.
410 Macklyn Ave
Santa Rosa, CA 95405
(707) 526-1294

SOFTWARE MEDICAL

POS/1™ VERSION 4.0
MEDICAL BILLING & A/R. Statements & Ins. forms. Aging & revenue analysis with bar graphs. Multiple doctors, practices, insurances. Day sheets, recall notices, referring physicians, audit trails, ledger details. Online update & access by acct. #/name. Customizable procedure & Dx codes; menu-driven; help screens PC-DOS, 128Kb, hard disk $2200
CHEN INFORMATION SYSTEMS, INC.
1499 Bayshore Hwy Suite 205
Burlingame, CA 94010
(415) 692-4358

CompuMedic™
PROVEN Medical Management System—in use 3 yrs. Patient data management, A/R, statements, insurance forms, practice analysis, word processing. Options—Split Aging By Doctor, Laboratory, Canadian, Industrial medicine, electronic claim processing. Training included. XT $3600 Dealer inquiries invited.
DATA STRATEGIES, INC
332 S. Juniper St., Suite 210
Escondido, CA 92025
(619) 489-9218

THRESHOLD
120 programs for A/R, office management, clinical studies, referring physician reports, electronic claims submission Includes: on-line help, full security with audit trails, patient name orientation, $5,500 FREE REMOTE DEMONSTRATIONS AVAILABLE. Requires hard disk, 256K, COBOL run time. PC-DOS
PHYSICIANS PRACTICE MANAGEMENT, INC.
1810 South Lynhurst Drive, Suite Q
Indianapolis, Indiana 46241
In the continental U.S. call (800) 428-3515
Indiana residents call (800) 792-3525

PC * CLAIM
Physician's office insurance claim filing with printed insurance forms & paperless claims processing Overnight electronic claims submission SPEEDS BLUE, M'CARE, PRIVATE INSURANCE SETTLEMENT. 23 programs, 3 diskettes, user manual. DOS/128K/modem/min. 2 floppy drives or h-disk. $89 95-MONEY BACK GUARANTEE
PHYSICIANS PRACTICE MANAGEMENT, INC.
1810 South Lynhurst, Suite Q,
Indianapolis, Indiana 46241
In the Continental U.S. call (800) 428-3515
Indiana residents call (800) 792-3525

DRUG INTERACTIONS
Computer assistance with patient management. Enter up to 20 drugs by brand or generic name and get report of possible drug interactions. Over 500 drug names/3900 entries in memory. 128K Mono & printer needed. Extremely thorough: $89 (From PA. add 6% tax) Send addressed stamped envelope for sample report.
Dr. Richard H. Jeffries
4600 Custer Drive
Harrisburg, PA. 17110

BILLING: ALL PROFESSIONALS
MED/NOMMED . Get dignified prfsnl sttmnts, insur forms, reprts, indiv/batch, any period any time $30 entries/mo/acct in 9999 accts. Aging.6 srvc prvdrs. Easily format/rvs sttmnt, tax, fin.chrg, fees, dx/servc codes, time billing. IBM-PC, XT, Jr. Tandy. 128K, 1-8 drvs. Any prtr. PRO-BILL $395 pp. Working SAMPLE $65 pp. Documentation $35 pp
PROFESSIONAL MICROWARE (attn: Dr. Schwarz)
735 St. Johns Ave. #403
Highland Park, IL 60035
(312) 346-7076

NODVILL DIET PROGRAM
"TAKE A BYTE" calculates sixteen nutritive values for meals and daily food intake and compares the totals to a personal Recommended Daily Allowance. The USDA Bulletin #72 Data Base (733 food items) can be expanded and modified to analyze eating habits and plan diets. TRS80 I/III/4 PC Compatibles $72.95.
NODVILL SOFTWARE
24 NOD ROAD
RIDGEFIELD, CT 06877
(203) 431-6449

DRs/MANAGEMENT: A joy!
Quite simply the difference is ease of use; an intuitive logical flow which fits the needs of an active practice. Designed by a practicing physician, we have all the billing, mgt, AR, scheduling, recall & search features you'd expect. PLUS full problem oriented medical records, graphics & much more. Simply the best! Try it and be convinced. DEMO for PC, XT or compatible with full manual only $39. VISA/MC/COD.
MEDSOFT of California, Inc.
11772 Sorrento Valley Road, Suite 101
San Diego, CA 92121
(619) 259-8282

SOFTWARE
One-of-a-kind

RAM DISK II
RAM DISK II is a 180K RAMDISK and comes with a PRINT SPOOLER Runs on IBMPC compatible systems, AND WORKS EXACTLY LIKE ANOTHER DRIVE. Instantaneous loading of programs. NO hardware, NO commands, 100% software! Self-initializes at bootup. Searches ALL boards for memory. Only $59.95 for the Ram Disk & Print Spooler

RENSIN COMMUNICATIONS

RENSIN COMMUNICATIONS
PO BOX 414
College Park, Maryland 20740
(202) 728-7955

HOTEL 2000
A hotel management software package for the IBM-PC and compatible micro computers. Includes all hotel functions: Reservations, Front Desk, Housekeeping, Guest Accounting and Night Audit. For the back office, HOTEL 2000 provides an interface to many G/L and A/R packages. All other general business packages may also be used. It is a "USER-FRIENDLY" system which guides the user with menus and messages and requires no previous computer experience whatsoever. Demo kits are available from $190.00 and individual modules from $1,350. Dealer inquiries are welcome.
MOSHOV CORPORATION
47 Marchwood Road Suite 2-G
Exton, PA 19341
(215) 363-8850

TUNESMITH/PC™
Now you can make GOOD MUSIC on any IBM PC! It's easy with this amazing Music Development System—there's an ON-LINE TUTOR to guide you, plus a complete HELP screen. Simulated CHORDS allow you to create complex music. Special-purpose FULL-SCREEN music editor; 8 SAMPLE tunes to educate and entertain Requires 96K, 1 drive, 80-column display. Introductory offer: $49.95 (plus $5 shipping).

TuneSmith/PC™

BLACKHAWK DATA CORPORATION
307 N Michigan Ave
Chicago, IL 60601
VISA or MC: (800) 328-5727 ext 131
in Minnesota: (800) 742-5685 ext 131

SOFTWARE
OPERATING SYSTEMS

MULTIPLE USERS UNDER PC DOS
MultiLink turns PC-DOS into an efficient multi-user multi-tasking operating system. Additional users are supported by attaching inexpensive CRT terminals or modems to serial ports on the PC, and can run normal applications designed for PC-DOS. Includes print spooling, keyboard enhancer, and communications software.

THE SOFTWARE LINK INCORPORATED
8601 Dunwoody Place Suite 336
Atlanta, GA 30338
(404) 998-0700

MICROSOFT XENIX-UNIX SYS 3
Multi-user, multi-tasking System III plus Berkeley enhancements. Bourne Shell, "C" shell, the vsh visual shell, vi, almost 200 Utility prgms. Networking via uucp and Micnet (LAN). Utilities move files between DOS & XENIX. File & Record locking, 10 simultaneous prgms. Total OS-$595. Development pkg $595, Text pkg $495, all $1350.
Unidot Systems
602 Park Point Drive
Golden, CO 80401
(303) 526-9263

SOFTWARE
PERSONAL

NEW ELECTRONIC CALENDAR
Highlight important dates. Holds 10 messages per day. Plan day, month, year activities in advance. Peek at your future. Instant reminder. Don't miss important dates. Menu driven. Prints on command. Req IBM-PC, 64K, mono display. Printer opt. $29 95 ea. + $2 00 shipping VISA/MC give expiration date
ELECTRONIC CALENDAR
Home Software Systems
P.O. Box 381557
Germantown, TN 38183

SOFTWARE
PREVENTIVE MAINTENANCE

MAINTENANCE & INSPECTION
An easy-to-use computerized method to organize, operate, and control an effective preventive maintenance system. Applicable to any type of business or industry Full screen input and displays, plus function key help command. Maintains historical data, creates work orders, and provides numerous reports. For information write to.
PENGUIN COMPUTER CONSULTANTS
P.O. Box 20485
San Jose, CA 95160
(408) 997-7703

SOFTWARE
REAL ESTATE

REAL ESTATE TOOLS I
Over 45 powerful, easy-to-use, menu-driven analyses of mortgages (regular, balloon, GPM, constant principal, wrap), leases, construct. Loans and variable/grouped cash flows plus amortizations. Computes IRR, NPV, FMRR, price, points, yield, etc. For IBM PC/XT/compatibles, 128K, 2 DS drives 228-page manual. $299.
ANSONN SOFTWARE INC.
2801 N. Surrey Drive
Carrollton, Texas 75006
(214) 446-4340

EZ-RE INVESTOR TEMPLATES
Complete analysis package for the Real Estate Investor. For Equity Share, Rent House, Apartments, Warehouses, and Office Buildings. Five mortgages can be ARM FHA245, amort, deferred int. or int only. Ten year projection of cash flow, deductions, sell price, tax at sell, gain or loss per year, and after tax IRR. Expenses, int, rent, and appreciation adjust annually. Also 45 year loan amortization template. Prof report. Requires LOTUS 123 and 256K. $50 PPD Money back guarantee. Visa, MC.
LB ASSOCIATES, INC
8817 Skokie Lane
Vienna, VA 22180
(703) 938-9093

REAL ESTATE CONSULTANT
A sophisticated real analysis package designed to make investment decisions easy. Features Amortization and Depreciation schedules, VIRs, Balloons, and Known Loan Payments. This package handles up to eight mortgages with wraps, syndications, partnerships and individuals; investment tax credits. $275.00. Dealer inquiries welcome
CONSULTANT SYSTEMS, INC.
3704 State Street, Suite 311
SANTA BARBARA, CA 93105
(805) 682-8927

REAL ESTATE FINANCE PAK
Fifteen Real Estate Finance programs with source code for IBM PC (DOS 2.0, 2.1). Loan Amortization for FHA/VA, FNMA, GPM, Fixed Principal, and Balloon Depreciation using DDB, 150%, 125% SL, and SYD. Plus Banking and Financial Tables, IRR, and Unknown Yield for WRAP with up to 3 underlyings. $55.
MICROBANK SYSTEMS
14640 Burbank Blvd., Suite 105
Van Nuys, CA 91411

SOFTWARE SCIENTIFIC

LITERATURE FILING SYSTEM
SearchLit Version 2 0 stores and searches bibliographic data for your literature collection. Retrieval based on title, author, source, abstract or key word index. Absolutely no programming required. Will merge downloaded data. Sorted output. Source code & file structure provided. DOS 1 1, 2.0. $249.50. Send $10 for Demo-Disk.
MediSoft
1595 Soquel Dr., Suite 350
Santa Cruz, CA 95065
(408) 476-7106

SOFTWARE SECURITY

BIT-LOCK® SECURITY
Guard your valuable software from PIRACY. Our inexpensive security system protects you from lost profits. Copies will only operate with a BIT-LOCK device attached. BIT-LOCK's powerful multi-layered security has proven its effectiveness on IBM PC/XT, TRS-80, Apple and commodore computers thru the test of time.
MICROCOMPUTER APPLICATIONS
7805 So Winderemere Circle
Littleton, CO 80120
(303) 922-6410

N-CODE™ Data Security
Fast, ultra-secure data encryption system. N-CODE protects your files from unauthorized access or change. Encrypt/decrypt a single file, entire disk. Select or change coding key when you want. Unique password and coding system supplied. 30-day money-back guarantee. Uses DOS 1.1 or 2 0 $199 each. Demo disk $10. For orders/free brochure call anytime. VISA/MC/CHECK

K + L SOFTWARE
White Flint Mall
P.O Box 2303
Kensington, MD 20895
(301) 564-8669

SOFTWARE SERVICE

U.S. $8.00 including disk?
Yes! We have hundreds of famous programs for business, education, entertainment, back up utilities etc., specially for your IBM-PC; price at US $8 00 up (including disk and registered airmail handling). Write immediately with U.S. $1.00 for our airmail catalogue.
RELIANT
PO Box 33610
Sheung Wan Post Office
Hong Kong

SOFTWARE SORT

OPT-TECH SORT/MERGE
Extremely fast Sort/Merge program for the IBM-PC Can sort or merge multiple files containing fixed or variable length records. Run as a DOS command or call as a subroutine, plus many other features Now also sorts dBASE II files! Compare before you buy any other. Write or call for more info $99
OPT-TECH DATA PROCESSING
P.O. Box 2167
Humble, TX 77347
(713) 454-7428

SOFTWARE SPREADSHEET

TRANSFER/1-2-3®
Easy-to-use utility permits the transfer of any PC based data to 1-2-3.™ Provides input field selection & automatic cell assignment. Extends use of 1-2-3.™ on PC1, -XT or H-P 150. A must for mainframe-to-PC links. $90.00 (+ 6% in CA) Send check or M.O. to:
HAWAIIAN SOFTWARE COMPANY
4901 Morena Blvd , #203
San Diego, CA 92117
(619) 270-6316

SOFTWARE STATISTICS

SIGSTAT
SIGSTAT includes over 30 programs of the BMD statistical series, plus many advanced new features. Mainframe capacity (up to 80 var.) for uni—(e g , ANOVA, regression) + multivariate (e.g., canonical, factor) analyses, time-series, multidim scaling, crosstab, plots, and much more 8087 support opt. 256K, DOS, $595.
SIGNIFICANT STATISTICS
3336 N. Canyon Road
Provo, UT 84604
(801) 377-4860

NWA STATPAK
Powerful data manipulation utilities, ASCII data structure for interface to databases, word processors, etc. Statistical functions include probability, descriptive statistics, regression and correlation, non-parametrics, distribution functions, means testing, survey data analysis, & ANOVA $495
NORTHWEST ANALYTICAL, INC.
1532 Morrison St
Portland, OR 97205
(503) 224-7727

THE SURVEY SYSTEM
An easy to use, menu driven system for the entry, editing, processing and presentation of questionnaire data. The system can produce crosstabs and scores in banner format, statistics and bar charts. Tables and charts are camera-ready for professional presentations. Card readers and open-end coding/analysis options available
CREATIVE RESEARCH SYSTEMS
1864 Larkin Street, #2
San Francisco, CA 94109
(415) 771-0912

ELF-THE STATISTICAL PKG.
Reads & writes Visi-Calc, SuperCalc, Multiplan, dBase II, etc. Does Factor Analysis, Principal Components, Discriminant Analysis, Stepwise Regression, ANOVA (1 & 2 way), correlations, probabilities, t-Test, crosstabs, Frequencies, Transformations, permanent Database, and more. MC/VISA
THE WINCHENDON GROUP INC.
P.O. Box 10339
Alexandria, VA 22310
(703) 960-2587

ECONOMETRICS/APL
APL functions for OLSQ, INST, CORC, HILU, GLSQ, SURE, TSLS, LIML, OLS3, INLS, TGLS, and others Hypotheses tests, residual analysis, plots Ranks determinants, correlation matrices. Diskette of all functions and 70K of HELP files. $250 Requires STSC's APL*PLUS/PC. Documentation/examples (100pp.), $25/copy.
STEPHEN D LEWIS
Economics, Sonoma State University
Rohnert Park, CA 94928
(707) 664-2549/(707) 527-0396

CRISP
CRunch Interactive Statistical Package offers Statistical Capabilities that compare favorably to MAINFRAME software and Comprehensive Utilities for data management in an interactive menu environment. The result: well-balanced, efficient data analysis. $495 Evaluation copy $50
CRUNCH SOFTWARE
2547 22nd Avenue
San Francisco, CA 94116
(415) 564-7337

STAT-LAB
A professional menu-driven stat system with regular, stepwise, + robust regression, up to 4-way Anova, cross tabulation, forecasting, principal components, discriminant, scatter plots, histograms, t-test, univariate stats, nonparametrics. Reads ASCII files. Tape tutorial. 30-day trial. Transformations. $199.
STATLABS, INC.
865 E 400 North
Kaysville, Utah 84037
(801) 546-0445

SOFTWARE STOCK ANALYSIS

BRANDON STOCK SYSTEM
Full feature technical analysis system for PC & compatibles. Use the built-in buy/sell formula or the single keystroke graphing functions Support hard disk, Tymnet, Telenet, Uninet, Dow Jones (for updating), The Source, Compuserve. Full color, very fast high & medium res. graphics. Requires 128K, 2 DS/DD drives, Hayes compatible modem. Price: $325 VISA/MC.
BRANDON INFORMATION MANAGEMENT
615-N 666 W Germantown Pike
Plymouth Meeting, PA 19462
(215) 828-3249 or Toll Free
950-1088 (pause) BRANDON (215) 828-3249

TRENDPOINT
FOR TREND ANALYSIS & buy/sell timing. Adjusts for dividends & splits. Calculates various moving averages, relative strength, deviation from trend. Makes charts with your printer. Hi-res screen graphics. Keyboard & disk I/O. User Guide & 6 yrs NYSE Comp data. Req 128K. Bargain at $49.95 + $5.00 shpg. Free Brochure.
HARLEY D. WILBUR
9709 Elrod Road
Kensington, Maryland 20895

WALL STREET WINDOW
- Integrated stock pkg with extensive TECHNICAL ANALYSIS-moving avgs., stock comparisons, trendlines, relative strengths & more.
- Detail hi-res GRAPHS, avail. in four COLORS using COLORPLUS board.
- SPREADSHEET interface for portfolio updating.
- AUTOMATIC access to DOW JONES, historical & current quotes
- AUTORUN using saved keystrokes, $395, DEMO-$10.00.

R&D SOFTWARE ASSOCIATES
PO Box 2727
Reston, VA 22090
(703) 476-6597, 950-1088 (pause) 800-123

STOCKPLOT
An easy-to-use menu-driven program to assist you in making buy/sell decisions. Graphs high-low-close data. Displays volume, P/E ratios and dividend info. Follows 45 stocks for 60 days or 60 weeks. Editing section to correct data entry. Tax deductible for most investors. IBM PC 64K, 80 column display required. Send $29.95 or write for information.
SHANNON SOFTWARE, LTD-DEPT. S
PO Box 6126
Falls Church, VA 22046
(703) 573-9274

USE YOUR PRINTER! $39.95
DIGICON PRINT PACKAGE for IBM/Epson printers:
LAYOUT —Print sideways. Section pages for brochures, booklets. Select size and style of characters (up to 35/inch)!
SET UP —Easy setup of printer features such as italics, compressed, emphasized
EDITCHAR —Create or modify character sets interactively (20 + sets included!)
All with menus of single line input. Complete on-line help! DOS. 128K. Check or M.O. (PA 6%)
DIGITAL CONCEPTS
PO Box 8345
Pittsburgh, PA 15218
(412) 823-8314

SOFTWARE TAXES

PARTNERSHIP TAX ANALYSIS
Unique partnership tax planning and analysis program. Save millions for your own or your client's partnership. Program menus allow the evaluation of all planned partnership action for tax implications. System gives you alternative and backs each one up with court decisions, rulings, regs and opinions. Stand-alone, Runtime™ $2,495
STRAG ANALYTICAL SYSTEMS, INC.
P.O. Box 42825 Suite 350
Houston, TX 77242
(800) 835-2246 ext. 99. In Kansas (800) 362-2421 ext. 99.

TAX PREPARATION
1984 Federal tax program follows IRS forms and includes form 1040, sch. A-G, R, RP, SE & W and forms 2106, 2119, 2441, 3468, 3903, 4562, 4797, 4835, 4952, 4972, 5695 and 6251. Available for the IBM PC, PCjr, TI Pro, and DEC Rainbow with MS-DOS. Requires 128K. Price: $99; updates $29. Check/MC/Visa.
DUNPHY SYSTEMS INC.
2215 Deewood Drive
Columbus, Ohio 43229
(614) 891-2131

TAX PLANNING TEMPLATE
A diskette to be used with 1-2-3, or Symphony. User can toggle between 1983 & 1984 computations, incl. both years' tax tables. Computes state income taxes. 256K req. Flexible, menu-driven. Follows IRS forms by line number & incl.: 1040 Sch. A, B, C, D, E, G, W, SE, forms 2119, 2441, 3468, 6251. $75. Jan. '85 updates $10.
PERSONAL TAX PLAN™-PERMAR & ASSOC.
1125 Sunnyhills Road-Dept. PCM
Oakland, Ca 94610
(800) 443-0100 X644

TAX SURGEON I & II
Tax preparer & planner. Full screen display of forms make data entry/editing easy. Print IRS approved forms. Surgeon I ($49.95) has A, B, D, G, RRP, W, 2106, 2119, 2440, 2441, 3903. II for $89.95 adds 20 forms. 128K DOS 2.0 or PC Jr.. 84 update is ½ price. Professional version is $895. Visa, MC, COD.
TAXbyte Inc.
3803 28th St., Dept. JR
Moline, Illinois 61265
(309) 764-7245

TURBOTAX™
Full feature Federal income tax preparation and planning software. 33 forms, schedules, and worksheets. FAST! Calculates fully cross-referenced return under 3 seconds. WINDOWS! Operates like a spreadsheet. Exceeds IRS print specs. Full depreciation support. Much more! CA/AZ modules avail Dec. FREE update in Jan. Req. 192K. $65. VISA/MC. (CA res. 6½% tax)
ChipSoft, Inc.
5674 Honors
San Diego, CA 92122
(619) 453-8722

SOFTWARE TERMINAL EMULATION

BURROUGHS HANDSHAKE
AN ALL-SOFTWARE Burroughs MT9 83/TD 830 terminal emulator. HANDSHAKE allows PC or compatible microcomputer to communicate with existing Burroughs host programs. Also transfers files between the host and microcomputer disk storage concurrent with dialogue. Installed worldwide
SOFTWARE CLEARING HOUSE
771 Neeb Road
Cincinnati, OH 45238
(513) 451-6742 Telex 24-1665

BLUE LYNX
Replace your dumb terminals with smart PCs and XTs. TECHLAND SYSTEMS is the nation's leading synchronous communications company with over 6,000 BLUELYNX' installed. The BLUELYNX hardware/software product emulates the 5251/12 for the S/34, S/36 and S/38. Now bundled with AutoLynx for unattended operation ... only $745. BLUELYNX 3276 for the larger 43xx and 30xx mainframes, both SDLC and BSC versions, now comes bundled with Data Reader, a utility that facilitates the formatting of host files into Lotus 1-2-3, dBASE, etc ... only $795. Printer and up-and download support available with both versions.

TECHLAND SYSTEMS, INC.
25 Waterside Plaza
New York, NY 10010
(212) 684-7788

SOFTWARE TRAINING

THE AUTHOR® & AUTHOR PLUS
THE AUTHOR® is a flexible, reliable, COMPUTER AUTHORING SYSTEM. Its ease of use, automatic branching, complete record keeping & thorough documentation make it a proven winner. THE AUTHOR PLUS™ combines all of these features with GRAPHICS, expanded use of function keys, and full screen editing & entry.
RAPTOR SYSTEMS, INC.
324 South Main Street
Stillwater, MN 55082
Formerly—PHOENIX PERFORMANCE SYSTEMS
(612) 430-2980

ATHENA COMPUTER WISDOM
Athena Software Training activates your IBM-PC to capacity. Progressive Video tapes and interactive guide books facilitate personal learning on programs such as R:Base 4000, The Word, State of the Art General Ledger and Symphony. Athena delivers a convenient, affordable and simple solution to software understanding. Accept the wisdom of Athena. Available in VHS, Beta or ¾"
VIDEO LOGIC
15830 S.E. 114th
Clackamas, OR 97015
COLLECT (503) 657-7942

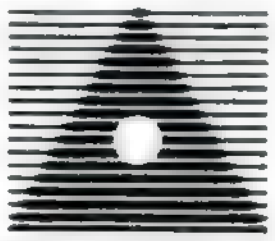
TOTAL RECAL™
Finally! An AUTHORING system for EVERYONE! Educators: create Computer Based Training. Programmers: develop on-disk tutorials. Managers: document office procedures. Features: full screen edit, extensive branching; unlimited menus, complete on-disk guide; and more! IBM PC or PCjr, 128K, 1 disk. $79.95 (CT + tax).
CUSTOM DATA SERVICES, INC.
PO Box 13
Cromwell, CT 06416
(203) 635-1589

SOFTWARE TYPESETTING

HIGH-TECH TYPESETTING
Transmit your text via toll-free lines directly to our fully automated typesetting system. $2. per K characters with a $5. minimum. Same day service. 200 typefaces in sizes up to 72 point. Send $15. + $3. shipping for our 220 page guidebook, or call toll free and use your MC, VISA or AMEX.
INTEGRAPHICS INC.
106A South Columbus Street
Alexandria, VA 22314
(800) 368-3342 or (703) 683-9414 in DC area

SOFTWARE UTILITIES

Hard Disk DIRECT ACCESS™
The ULTIMATE utility for any hard disk user. DIRECT ACCESS is a powerful hard disk management tool. Organizes your software programs into a "user defined" menu system. Features attractive screen display, rapid access into an application using a single keystroke & easy to learn. Also handles batch files & complicated DOS commands. Order today. Only $59.95 + $2.50 shipping. MC/VISA.



DELTA TECHNOLOGIES
PO Box 1104
Eau Claire, WI 54702
(715) 832-0958

SYMBOLIC DEBUGGING
The Mylstar SD Program enhances IBM DEBUG Program using the same command structure. Use symbol names, mathematical expressions, Batch Files, on-line help, multi-command macros, and loop structures. Makes your job easier, for PC-DOS 1.1, 2.0, 2.1 128K RAM minimum. $125.00 check, money order, MC or VISA.
MYLSTAR ELECTRONICS, INC.
165 West Lake Street Dept. 120
North Lake, IL 60164
(312) 562-7400

COPY PROTECTION BY MSD
The ULTIMATE diskette copy protection system designed for software developers and publishers. A variety of protection methods are available to suit your protection requirements. All IBM PC and XT environments are supported which includes DOS, BASIC (compiled and interpretive) Pascal, P-System, dBASE II and stand-alone systems. Customized systems also available. Requires 64K, two disk drives.

MICRO-SOFTWARE DEVELOPERS, INC.
214¼ West Main Street
St. Charles, Illinois 60174
(312) 377-5151

BASICWINDOW

Screen Generator and Processor for BASIC programmers. This package combines a Screen Painter for creating and modifying screens and Macro Language and Compiler for quicker coding and testing. Features COLOR, field variables, complete input editing, line drawing. For BASIC, BASICA, and BASIC Compiler users. Includes manual and reference card. $99.95 VISA/MC accepted.

BasicWindow™

G. FREEMAN & COMPANY, INC.
15 Albin Road
Stamford, CT 06902
(203) 327-9868

PADLOCK/PADLOCK II DISKS

PADLOCK furnishes the user with a method for providing protection against unauthorized duplication from DOS commands $99. PADLOCK II disks come preformatted with finger-print and serialization. PADLOCK II disks offer superior protection. Ask about our fast data encryption product. All work with hard disk, EXE/COM files and all DOS versions. MC/VISA.
GLENCO ENGINEERING
3920 Ridge Ave.
Arlington Hts., IL 60004
(312) 392-2492

SCREEN MANAGEMENT SYSTEM

SMS is simply the best utility available for designing, using, and saving color/monochrome screens. GOSUB's are supplied in BASIC to input, output, and edit screen data fields. Loads of extra features. We have been in business 15 years, winning many awards for programming excellence. Price $195, demo $50, Manual $10. VISA/MC. PC/XT/PC jr./64K/1 Disk.
DNA SYSTEMS, INC.
P.O. Box 1424
Saginaw, MI 48605
(517) 793-0185

KNOW THY PC!

- THE INSIDE TRACK gives your programs speed and control. Read files as fast as DOS, display data faster, load programs faster, control memory use, run any program from your program, copy-protect your disks, and much more. Fold-out memory map too! Disk (61 programs) & manual $45.
- The popular PEEKS 'N' POKES shows you how to access and modify the status of the PC. Perform DOS and BIOS function calls from BASIC or Pascal! Learn how to find more Peeks 'N' Pokes and much more. Disk (58 programs) & manual $30. Shipping—$2.50/order. MC/VISA.

DATA BASE DECISIONS
14 Bonnie Lane
Atlanta, GA 30328
(404) 256-3860

COPY II PC

COPY II PC backs up protected & unprotected software, with verification. Available memory is fully utilized to minimize disk duplication time. Also includes a drive speed utility that can pinpoint drive problems. For IBM-PC, $39.95 + $3 s/h ($8 outside North America). Prepayment required; VISA/MC, check or money order.
CENTRAL POINT SOFTWARE, INC.
9700 SW Capitol HWY #100B
Portland, Oregon 97219
(503) 244-5782

BACKUP RESTORE

Backup database or other files from a Winchester to a floppy under concurrent CP/M and/or CP/M 86. • Automatic volume management • Selective file backup/restore • Database backup/restore • Compression reduces space required to store data. Requires IBM PC/XT or clone with 128K RAM, one diskette drive and Winchester disk. To order use MC/VISA or send $99 to

AWARD SOFTWARE, INC.
236 North Santa Cruz Avenue Los Gatos CA 95030

AWARD SOFTWARE INC.
236 North Santa Cruz Ave
Los Gatos, CA 95030
(408) 395-2773

FULL CONTROL FROM BASIC

Cut development time, add speed & power to your programs w/NLIB. A library of assembly language sub-routines callable from BASIC, execute COM & EXE files, save & restore areas of the screen, clear & scroll windows, much more! Add DOS functions to your menus. Create fast help screens. Unlimited uses. All DOS versions $49.95. + $2.50 s&h. MC/VISA/CHECK. PA + 6% tax.
NATIONAL SOFTWORKS
65 East Elizabeth Ave
Bethlehem, PA 18018
(215) 867-4800

DOS PATH Command for Data

Now Lotus 1-2-3, dBASE II, WordStar and most others can access data files no matter where they are located! Works with hard disks and floppies. DPATH is a system stay-resident function that allows you to organize your disk any way you like. Includes a screen-oriented maintenance utility & a 60-page manual. DOS 2.0/compat. $25
PERSONAL BUSINESS SOLUTIONS INC.
P.O. Box 757
Frederick, MD 21701
(301) 865-3376

PERSONAL COPIER™

Personal Copier copies EVERYTHING! and, our monthly trade-in offer GUARANTEES that you're up to date with new and ever changing protection methods. Fully automatic with easy-to-use two-step graphic screen instructions ... anyone can use it. Every IBM PC user should have one. $39.95 - $3 s/h. M/C, VISA.
DISK-TECH
P.O. Box 162
Wasco, IL 60183
(312) 365-2803

NEW FOR FIXED DISK USERS

Organize your fixed disk more effectively with FloatFiles! Easily access and use application programs and data files from any directory. No more confusing batch files or path commands. Find files with forgotten directory location. On-line help eases use of both FloatFiles and DOS. DOS 2.0 or higher. Dealers welcome. Visa/MC accepted. $64.95
K.D.WARE, DEPT. 20
P.O. Box 712
Dekalb, IL 60115
(815) 756-6286

DISPLAY/MODIFY FILES

FILE MASTER allows you to quickly access file contents in HEXADECIMAL and ASCII format

- DISPLAY - View data in easy-to-read format
- MODIFY - Change data in files or programs using full-screen editing feature
- SEARCH - Locate data anywhere in files
- BROWSE - Page thru files forward, backward or directly to record # or offset
- PRINT - Print all or part of files in Hex and Ascii or text format
- ON-LINE HELP - Explains all functions

PC, XT, and compatibles. System includes complete documentation and full support at a special introductory price of only $39.95. $2 shipping (CA residents add $2.60 tax)
J.L. Schuller & Associates
14800 Rinaldi St., Suite 6
Mission Hills, CA 91345
(818) 366-6934

THE SCREEN GENERATOR v 3.0

If you can't display a FULL COLOR data entry screen with up to 200 values and process it for Add, Update, Delete or Inquiry in LESS THAN TEN Basic or Assembler statements, then YOU need the NEW SCREEN GENERATOR v 3.0. Total screen management and data entry processing for the Novice to the Professional. $125.
K+S SYSTEMS
P.O. Box 643
Drexel Hill, PA 19026
(215) 449-2754

PC BUYERS GUIDE

THE INDEPENDENT GUIDE TO PRODUCTS AND SERVICES FOR IBM Personal Computers. This master directory lists, describes, rates for ease of use, and tells you about the latest in software, hardware, accessories, supplies, books, services, et al. Everything for you and your IBM PC. It even includes an Index of Computer Camps for both adults and children. From the publishers of PC. An ideal gift at only $7.95 (+ $1.55 shipping/handling) to U.S. destinations; and $11.00 elsewhere. Residents of CA, CO, CT, DC, FL, IL, MA, MD, NJ, and NY add applicable sales tax. Checks or MasterCard or VISA acceptable (with number, expiration date and signature). U.S. funds only. Mail to.
PC BUYERS GUIDE
CN 1914
Morristown, NJ 07960

LAN & STAND ALONE UTILITY SOFTWARE COMBINED WITH CONSULTING EXPERTISE

Let our "TULL BOX" utilities software help your end users get to the data and files they need quickly and efficiently. Stand alone users will love it too! No more trying to search through the system for lost files-the "TUL BOX" not only leads you through and maps your current disk; but provides comprehensive access to the operating system in the hands of the knowledgeable user! We also publish the most up-to-date and complete technical evaluations available today for vendors' individual LAN packages. Over one half a century of combined technical and managerial expertise make turnkey systems design and development for the IBM PC and compatibles an economically sound investment. Write or call for more information about the "TUL BOX" and our other exciting products and services.

TECHNOMICS
LINKING TECHNOLOGY & ECONOMICS

TECHNOMICS
12325 Poway Road
Poway, CA 92064
(619) 578-3857

MAID-PC™ COMPARE UTILITY

USES sophisticated matching technique to compare any two versions of a file. Uses incl: program audit trails, cloning, debugging, aid to productivity and quality assurance. For IBM-PC-min. requirements 1 disk drive, 128K memory, printer. Call or write for details. $49.95, quantity discount available.
DATA AID, Inc.
66 Granville Road
N. Granby, CT 06060
(203) 653-2309

BLUEBOOK

CopyWrite
Copywrite backs up IBM PC software. We have not found anything that we can't copy. CopyWrite is revised monthly to keep up with the latest in copy protection, and comes with a trade-in offer. It needs an IBM PC, 128K and one disk drive, but can use more memory or another drive. $50 US. Check/Credit Cards. U.S. Inquiries.
QUAID SOFTWARE LIMITED
45 Charles St. East
6th Flr.
Toronto, Ontario Canada M4Y 1S2

SYMD: SYMBOLIC DEBUGGER
SYMD simplifies debugging by utilizing source symbols and line numbers. SYMD also lets you: Display test program output on separate Flip-screen: Examine/change real numbers; Assign permanent breakpoints; Backtrace instruction sequences, Profile your program to find hot spots. And much more. Priced at only $125.
D+V SYSTEMS
400 Amherst St
Nashua, NH 03063
(603) 881-7140

SOFTWARE

WORD PROCESSING

MULTIMATE™
Multimate™ is a function key oriented, menu-driven word processor comparable to larger dedicated systems. The system offers over 100 WP functions and utilities including an 80,000 word speller/dictionary, merge, boiler plate call-back and the most advanced printing and sheetfeeder capabilities. An on-line help-facility, complete users manual and adhesive color coded key tabs are provided to facilitate minimal training time. A truly user friendly system.
SOFTWORD SYSTEMS, INC.
52 Oakland Ave., North
E. Hartford, CT 06108
(800) 243-4646

WordPerfect
A powerful word processing package which comes with special features such as a spelling dictionary, math, text columns, footnotes, headers/footers, and macros. Proportional spacing and special characters such as Greek, math and foreign symbols are supported. Easy to learn and use. $495
SATELLITE SOFTWARE INTERNATIONAL
288 West Center Street
Orem, UT 84057
(801) 224-8554

LASER TYPE
Laser Type is an intelligent text formatter capable of generating table of contents, preface, index, line tables for term papers, software & technical manuals, & books. Laser Type is highly command oriented with sophisticated commands including keep areas, font selection boxed text, chapter, section, subsection. $395.
SOFTLAB, INC.
P.O. Box 879
St. George, UT 84770
(801) 628-4969

PC-WRITE™
Features: wordwrap, search/replace, justify, block move/copy/delete, headers/footers, etc. Help screen, quick ref card, 100 page manual. Split screen, edit two files at once. Disk with software and manual $10; registration with support, source, and commissions $75. Shareware: can copy and share with others. Visa/MC.
QUICKSOFT
219 First North #224c
Seattle, WA 98109
(206) 282-0452

MY WORD! IS JUST $25!
MY WORD! is a WS-like word processor for the IBM PC/XT/JR or compatible (even Tandy 2000) Sort, mail merge, quick print, use 256 char.! Word wrap, 100+ operations, won't lose text, ASCII files. Manual with index included. Full source code: just $25 more! 96K, 1 drive, DOS 1.1, 2.0, or 2.1 30-day money-back guarantee!
T N T SOFTWARE, INC.
34069 Hainesville Road
Round Lake, IL 60073
(312) 223-0832

USERS GROUP

USE US
Consult PC: Blue Book every issue for easy reference to services/hardware/software. You can be part of PC: Blue Book for 4 issues for only $800. You get 7 lines of copy, PLUS a boldface heading, PLUS 4 lines for your name, address, and phone number. Logo art $500 additional. Reach out to the largest market of IBM PC owners and users TODAY. Call Lois Price collect today. PC: BLUE BOOK
1 Park Avenue
New York, NY 10016
(212) 503-5115 collect

ALWAYS AT SALE PRICES IBM Compatible ALWAYS AT SALE PRICES

OUR TRS-80s Have the Radio Shack warranty

COMPUTER DFW CENTER

WE SHIP FAST!

DFW COMPUTER CENTER
326 MAIN ST., GRAPEVINE
TEXAS 76051 — (817) 481-7283

To get YOUR SALE price CALL:
TOLL FREE 1-800-433-SALE

®Registered Trademark of International Business Machines

The Professional Edge:

PC TECH JOURNAL

P.O. Box 2966, Boulder, Colorado 80322

YES! I want to break away from the pack. Please accept my subscription to PC TECH JOURNAL for:

☐ 9 issues for $19.97—SAVE 11%!
☐ 12 issues for $24.97—SAVE 17%!
☐ 24 issues for $43.97—SAVE 27%!

Savings based on full one-year (12 issue) subscription price of $29.97.

Mr./Mrs./Ms._____
please print full name

Company_____

Address_____

City_____ State_____ Zip_____

Check one: ☐ Payment enclosed ☐ Bill me later
Charge my: ☐ American Express ☐ Visa ☐ MasterCard

Card No._____ Exp. Date_____

Add $1 per issue in Canada and all other foreign countries. Please allow 30 to 60 days for delivery of first issue.

Your subscription to PC TECH JOURNAL is tax deductible if used in your profession. Check with your accountant.

PC8Z094

If you're an advanced IBM PC user involved in systems design and implementation, you need the professional edge to stay ahead of the pack... *you need PC TECH JOURNAL.*

Every month you'll receive the leading *advanced* IBM PC magazine that brings expert users like yourself sophisticated and innovative insights, developments and ideas. You'll discover in-depth articles and features covering Graphics, Program Documentation, Distributed Data Processing, APL, and Systems Interfacing and Development.

If you're ready to break away from the pack and establish the professional edge in your office, subscribe to PC TECH JOURNAL today, it is the magazine that's written for experts in IBM personal computing, by experts!

PC: Mart

Dysan diskettes

5¼"

Specify soft, 10 or 16 sector

	Price 10-90	Price 100+
Single sided double density	2.50 ea	2.35 ea
Double sided double density	3.15 ea	3.00 ea

Certified Check - Money Order Personal Check Allow up to 2 weeks for personal checks to clear Add $3.00 per 100 or part to each order for U.P.S. shipping charges NJ Residents add 6% sales tax

DATA EXCHANGE INC
178 Route 206 South, P.O. Box 993
Department C
Somerville, N.J. 08876 • (201) 874-5050

CIRCLE 558 ON READER SERVICE CARD

IBM PC* COMPATIBLE Model 120

119 Model

128K, disc control, multifunction card

12 expansion slot

(without drive) (8 expansion slot) $1300

(front facing for above)

PARTS FOR ABOVE:
Power Supply 65W $150
Color graphic card $220
8088 main board $450
Bare board $50
Keyboard from $160
Disc controller $220
CASE $120

16 bit CPU Board

US$420

64K Apple • compatible

IBM

$29

-Add 5% as shipping charge
-Full repair & guarantee available

ABC COMPUTERS LTD. PH: (604) 254-2834 & 254-1062
663 E. HASTING ST., VANCOUVER, B.C. CANADA V6A 2Z8

TELEX: 04-51338 ABC

† Trademark International Business Machines Corp
* Trademark Apple Computer Inc. Dealer inquiries welcome

We Help Bring Your Family Together

6 Types of Charts and Sheets
Indices
User Fields
Notes, Footnotes and Sources
No Limits
Adapts to Your Hardware
Comprehensive
Easy to Use
And Much, Much More

Send for brochure and sample printouts.
Family Roots includes detailed manual and 2 full diskettes of programs for your Apple II* or IBM PC*

Other genealogy software also available

Price
$185 plus
$3.50 Postage
Visa, Master card Accepted

Family Roots
QUINSEPT, INC.
P.O. Box 216, Lexington, MA 02173 / (617) 862-0404

Apple Macintosh, IBM-PC, XT, hard disks, Eagle, Compaq, Columbia, NCR Olivetti, Leading Edge,

All peripherals and Components

Printer: Epson, Okidata, Genimi, Radix, NEC, Plotters/printers.
Monitors: Disk
Drives, Modems, Diskettes

SOFTWARE FOR PC & MULTIUSERS

SOURCE COMPUTERS

COMPUTER EXPO, INC
(213) 208-0352 (213) 208-0259
(213) 906-1984 (213) 906-1634

FANTASTIC LOW PRICES ON
BASF
QUALIMETRIC DISKETTES

• LIFETIME WARRANTY •
• PLASTIC STORAGE CASES •

$139.00 5¼" SSDD Qty 20 $189.00 5¼" DSDD Qty 20

All BASF Diskettes include a PLASTIC DISK CADDY Tyvek sleeves reinforced hubs user identification labels and write protect tabs

Shipping 5¼" DISKETTES—Add $3.00 per 100 or fewer diskettes
Payment: VISA or MASTERCARD accepted COD orders only add $3.00 handling charge Taxes Illinois residents only add 8% sales tax

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCT AND QUANTITIES!

For orders only: 1-800-621-6827
(In Illinois: 1-312-944-2788)
(All other calls: 1-312-944-2788)
Hours 9AM-5PM Central Mon.-Fri.

DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Reseller Information Processing Media BASF

CIRCLE 551 ON READER SERVICE CARD

IBM PC

SPECIAL $2,449 256K

2 Floppies 360K controller

KEYBOARD $125 IBM COLOR CARD $249
PLANTRONICS COLOR PLUS $379
Immediate availability

IBM — XT in stock!!! $ CALL

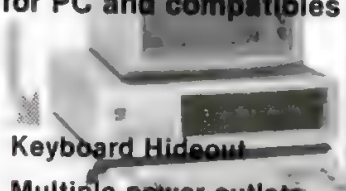
COLUMBIA CORONA EAGLE XT SEEQUA $CALL

BHAT- NEVADA (800) 845-5555
ORDERS & INFORMATION (702) 451-3305
P.O. BOX 50029 HENDERSON, NV 89016 Mon-Fri 7:00 AM-5:30 PM

CIRCLE 556 ON READER SERVICE CARD

HIDEY

10MB Hard Disk
for PC and compatibles



Keyboard Hideout

Multiple power outlets
Integrated appearance
Plus ... low price

Personal Micro Computers, Inc.
275 Santa Ana Court, Sunnyvale, CA 94086
(408) 737-8444

CIRCLE 552 ON READER SERVICE CARD

EMULATE *HP* TERMINALS WITH YOUR IBM PC

Now your IBM Personal Computer can be used as a Hewlett-Packard 26XX family terminal. Instead of just a terminal, you'll have a general purpose microcomputer. **VDTE 2** is the powerful, easy to use terminal emulation program that provides the features you need!

HP2624, HP2648 and DEC VT52 modes
HP2624 block format mode
Eight displayed softkeys (program controlled)
Subset of HP2648 vector graphics
Supports both serial ports simultaneously
Fourteen pages of off-screen scrolling memory
Tens speeds include 300, 1200 and 9600 baud
General purpose file transfer between PC and host

Price $200 Visa and MasterCard welcome

Inner Loop

Inner Loop Software
5456 McConnell, Ste 120
Los Angeles, CA 90066
(213) 822-2800

CIRCLE 555 ON READER SERVICE CARD

Verbatim Datalife diskettes

5¼"

Specify soft, 10 or 16 hard sector

	Price 10-90	Price 100+
Single sided double density	2.15 ea	2.00 ea
Double sided double density	2.75 ea	2.60 ea

Certified Check - Money Order - Personal Check Allow up to 2 weeks for personal checks to clear Add $3.00 per 100 or part to each order for U.P.S. shipping charges NJ Residents add 6% sales tax

DATA EXCHANGE INC
178 Route 206 South, P.O. Box 993
Department C
Somerville, N.J. 08876 • (201) 874-5050

CIRCLE 557 ON READER SERVICE CARD

ICs PROMPT DELIVERY!!!
SAME DAY SHIPPING (USUALLY)

DYNAMIC RAM			
256K	256Kx1	150 ns	$34.34
256K	256Kx1	200 ns	26.26
64K	64Kx1	150 ns	4.77
64K	64Kx1	200 ns	4.62
16K	16Kx1	200 ns	1.21
EPROM			
27256	32Kx8	300 ns	$49.97
27128	16Kx8	300 ns	18.77
27C64	8Kx8	200 ns	22.50
2764	8Kx8	250 ns	6.50
2732	4Kx8	250 ns	6.37
2716	2Kx8	450 ns	3.50
STATIC RAM			
6264LP-15		150 ns	$31.25
6116P-3		150 ns	6.36

Quantity One Prices Shown

Open 6 days we can Ship via Fed-Ex on Sat.

Factory New, Prime Parts µPos
MICROPROCESSORS UNLIMITED
24 300 South Peoria Ave
BEGGS, OK 74421 **(918) 267-4961**

Prices shown above are for September 17, 1984

Please call for new discount & current prices. Prices subject to change. Please expect higher prices on some parts due to worldwide shortages. Shipping and insurance extra. Cash/money order/cashier's check orders accepted. PO's accepted for qualified customers. Shipping: Orders received by 1 PM will be shipped same day. Orders received after 1 PM will be shipped next day. Insurance: Orders received by the next morning via Federal Express Standard Air $5.99

3M diskettes

5¼"
Specify soft, 10 or 16 sector

	Price 10-90	Price 100 +
Single sided double density	1.90 ea	1.75 ea
Double sided double density	2.45 ea	2.30 ea

Certified Check · Money Order · Personal Check Allow up to 2 weeks for personal checks to clear Add $3.00 per 100 or part to each order for U.P.S. shipping charges
NJ Residents add 6% sales tax

DATA EXCHANGE, INC
178 Route 206 South, P.O. Box 993
Department C
Somerville, N.J. 08876 • (201) 874-5050

CIRCLE 554 ON READER SERVICE CARD

GREAT DISKETTES
Super Low Prices
BIG NAME, NO NAME

You've used these diskettes a hundred times and never knew their name They're used by many of the major software manufacturers and now you can buy them

$1.19 ea 5¼" SSDD Qty 50 — **$1.59** ea 5¼" DSDD Qty 50

5¼" SSDD 96TPI **$1.89** ea 5¼" DSDD 96TPI **$2.14** ea

••• LIFETIME WARRANTY! •••

These are bulk packed diskettes with white Tyvek sleeves No user identification labels or write-protect tabs are included

Shipping 5¼" DISKETTES Add $3.00 per 100 or fewer diskettes **Payment** VISA or MASTERCARD accepted COD orders only add $3.00 handling charge **Taxes** Illinois residents only add 8% sales tax

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCT AND QUANTITIES!

For orders only: 1-800-621-6827
(In Illinois: 1-312-944-2788)
(All other calls: 1-312-944-2788)
Hours 9AM 5PM Central Mon -Fri

DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago Illinois 60611

DISK WORLD! — Home of BIG NAME, NO NAME DISKETTES

CIRCLE 560 ON READER SERVICE CARD

SAVE MORE THAN EVER ON 3M Scotch® DISKETTES

SALE PRICES ON 5¼"!
Prices good thru 9/30/84.

$1.49 ea 5¼" SSDD Qty 20 — 5¼" DSDD **$1.95** ea Qty 20

LIFETIME WARRANTY!

5¼" SSDD 96TPI	**$2.19** ea	5¼" DSDD 96TPI	**$2.75** ea
8" SSSD	**$2.05** ea	8" SSDD	**$2.50** ea
8" DSDD	**$3.10** ea		

All diskettes are boxed in 10 s with Tyvek sleeves reinforced hubs on 5¼" user identification labels and write protect tabs

Shipping 5¼" DISKETTES Add $3.00 per 100 or fewer diskettes 8" DISKETTES Add $4.00 per 100 or fewer diskettes **Payment** VISA and MASTERCARD accepted COD orders only add $3.00 handling charge **Taxes** Illinois residents only add 8% sales tax

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCT AND QUANTITIES!

For orders only: 1-800-621-6827
(In Illinois: 1-312-944-2788)
(All other calls: 1-312-944-2788)
Hours 9AM 5PM Central Mon -Fri

DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago Illinois 60611

DISK WORLD! Authorized Distributor Information Processing Products 3M

CIRCLE 559 ON READER SERVICE CARD

Big machine Chess now on PCs!

The co-author of Duchess, the program that beat the Russians presents ChessWright for your PC

A decade's work with top-class Chess programs results in a major breakthrough in ease of use! Enter moves with Arrow keys or in Algebraic or Descriptive Chess Notation.

- Seven levels of play, blitz to postal Chess
- Extensive opening book – rarely repeats a game
- Save & restore games on disk
- Set up problems, games
- Includes many historic games
- Print score on printer
- "Instant replay" of game
- On-screen help
- Can suggest moves for you
- Instant move take back

Check, MasterCard or Visa $50
Please specify IBM or DEC version
(NC residents please add 4% sales tax).

Order from:
SoftWright Systems, P.O. Box 3208
Durham, N.C. 27705
(919) 383-4441

SoftWright Systems

*IBM is a trademark of International Business Machines Corp., DEC is a trademark of Digital Equipment Corp.)

DISK DRIVES

Qume 142A	$199
Teac FD55B	$169
Tandon TM100 2	$199
Tandon TM100 4	$295
CDC 9409	$219
Case and PS	$ 45

PC EXPANSIONS

Maynard Disk Controller	$ 114
Sandstar Series	call
Internal 10MB systems WS1	$ 899
WS2	$1079
Quadboard (64K)	$ 269
Quadboard (348K)	$ 514
Quadcolor I	$ 199
AST SixPakPlus (64K)	$ 269
SixPakPlus (384K)	$ 514
MegaPlus (64K)	$ 269
I/O Plus	$ 129
AST-3780	$ 659
PCnet starter kit	$ 809
MonoGraphPlus	$ 389
HERCULES graphics board	$ 349
HAYES Modems 300	$ 209
Smartmodem 1200	$ 489
Smartmodem 1200B	$ 435
Set of 9 chips (64K)	$ 45

VLM Computer Electronics
10 Park Place • Morristown, NJ 07960
(201) 267 3268 Visa MC Check or COD

THE BUYERS GUIDE

THE MASTER DIRECTORY OF PRODUCTS FOR THE IBM PC, PC XT, PCjr AND MOST COMPATIBLES!

AVAILABLE AT YOUR LOCAL NEWSSTAND AND COMPUTER STORE.

BASF FlexyDisks®

qualimetric

5¼"
Specify soft, 10 or 16 sector

	Price 10-90	Price 100 +
Single side double density	1.60 ea	1.45 ea
Double side double density	1.85 ea	1.70 ea

Hard sectors in Library box only add .15.
Certified Check · Money Order · Personal Check Allow up to 2 weeks for personal checks to clear Add $3.00 per 100 or part to each order for U.P.S. shipping charges
NJ Residents add 6% sales tax

DATA EXCHANGE INC
178 Route 206 South, P.O. Box 993
Department C
Somerville, N.J. 08876 • (201) 874-5050

CIRCLE 553 ON READER SERVICE CARD

FREE PC BOOK

•• GET ONE BOOK FREE FROM THIS AD WITH EVERY $20.00 PURCHASE ••

Small Business Programs for the IBM PC
Easy ready to run programs for your PC – mailing list, cost proposal, mortgage analyzing and a very powerful BUSIPACK combining invoice writing, mailing list and inventory control. Inventory file is automatically updated by the invoice writing part. All this plus twelve more programs to increase productivity on your PC.
Book and disk package
Want to save 8 hours? Go ahead and get the complete package PC-CHAR
Order No 521 Book/disk $ 39.00
Order No 52 Book only $ 12.95
Order No 520 Disk only $ 29.95

MS-DOS Introduction and Applications
How to get the most out of your IBM PC or compatible, use the keys and keep it right beside your computer. Contents: Introduction, How to do, Information, application programs, How to set your menu commands and how to use the essentials
Order No 56 Book only $ 9.95
Book and disk package containing all the programs in the book No documentation
Order No 561 Book/disk $ 39.80

Statistics on the IBM PC
Fundamentals of data on bar graphs and pie charts, probability, Markov Analysis, Discrete distribution, normal distribution, Poisson Distribution, statistical test, soft significance, t distribution, non parametric test, variance, linear regression, auto correlation, forecasting and trend, statistics and gambling.
Each subject contains an introduction, a program in BASIC and a practical application
Order No 47 Book only $ 12.95
Order No 470 Disk only $ 29.95
Order No 471 Book/disk $ 39.00

BASIC in 60 Minutes
An easy way to learn BASIC on the APPLE, the IBM PC, Compatibles, Commodore and A"ARI. Each command with a practical sample and cross reference 130 pages
Order No 38 Book $ 7.95

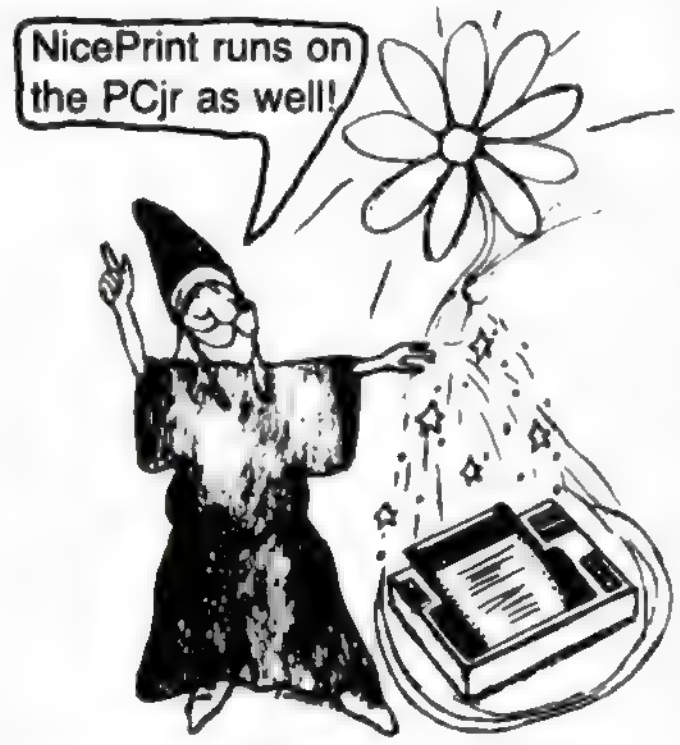
Small Business Programs for the Commodore 64
Ready to use and easy to run programs, including, paragraph, invoice writing, mortgage, economic order quantity and break even analysis. Plus 9 other powerful programs
Order No 188 Book $ 12.95
Order No 1880 Disk only $ 29.95
Order No 187 Book/disk $ 39.00

Dealer and Distributor inquiries are invited
ELCOMP PUBLISHING INC
2174 W Foothill Blvd Unit E
Upland CA 91786
Phone (714) 623-8314 Tlx 29 81 91

PAYMENT Check VISA MC
CA residents add 6% sales tax
Add $2.00 for shipping
Outside USA add 15% for shipping
In Singapore contact telex 22 456
In Germany contact telex 43 ...

Copyrighted material

TURN AN IBM PC DOT MATRIX PRINTER INTO A DAISY . . .



with *NicePrint.*

The standard of printing excellence is the daisy-wheel printer. The **NicePrint** software package improves your IBM, EPSON, or Gemini graphics printer to near daisy-wheel print quality. And possibly best of all, WordStar, 1-2-3 and most other programs will run just as before with the exception that your dot matrix printer now prints like a daisy!

Look at these actual print samples:

Here is a sample of dot matrix printing.

Change it into a daisy with NicePrint!

There are six font styles in this package:

Roman, Sans Serif, ORATOR LARGE, Script style, OLDE ENGLISH and COMPUTER.

All font styles can be underlined, **boldfaced,** and *italicized* easily.

In addition, all fonts can have pica, elite, and four other pitches for maximum versatility.

NicePrint represents the ultimate in user friendliness because you only have to read one page of the manual to get it going!

For your convenience, **NicePrint** is not copy protected.

Contact your local IBM PC dealer for a demonstration. If he doesn't carry it, call or write us:

Spies Laboratories
(pronounced "speez")
P.O. Box 336
Lawndale, CA 90260
(213) 538-8166

Suggested retail price: $95.00

WordStar is a TM of MicroPro Corp
1-2-3 is a TM of Lotus Development Corp

CIRCLE 119 ON READER SERVICE CARD

Fractals and The IBM PC

How do you figure the volume of a cloud or the surface area of a piece of cauliflower? With fractal dimensioning.

This is the first in a two-part series on fractional dimensions, or fractals, and the IBM PC. This installment includes a program listing for KOCH.BAS, a Koch curve generator. The second article will cover the use of a fractal algorithm for describing natural objects.

How long is the coast of England? Put some sailors in a rowboat and send them out with measuring sticks, and in a month or two you'll have an answer. But the accuracy of their answer depends on the measuring device they use. The measurement they'll get if they carry a 10-foot pole will be quite different from the one they'll get if they use a 6-inch ruler. And both of these answers will differ from the measurement obtained from satellite pictures. With an irregular boundary like a coastline, the closer you look, the longer the measured coastline appears and the more detail you'll see. Yet the overall pattern remains the same whether we look from 2 feet or 2 miles away.

When Euclid described his geometry, he wrote of planes and lines and points, not surfaces crawling with irregularities. Yet portraying the real world on a computer means modeling it on those strange wrinkled objects. Spheres or flat planes just won't do the job properly—a meteorologist needs a better description of a cloud; an anesthesiologist, a better model of bronchial capacity.

Entering the 1½ Dimension

Euclid devised methods for dealing with "dimensionally concordant" sets of objects—objects with dimensions that coincide. But when we look at the real world—at the surface of a cloud, the volume of the circulatory system, or the area of a tree or a piece of cauliflower—we find examples that don't fit Euclid's system. These natural objects can be called "dimensionally discordant."

Topologists in the last hundred years developed a method for describing such complex shapes. Their work resulted in a whole new form of dimensioning in which the dimension isn't required to be an integer; hence the name "fractional dimen-

Illustration: Carter Goodrich

```
10 '   KOCH.BAS -- Koch curve generator  -- (C) 1984, S M Entvenik
20 '
30 '   This program uses a square as an initiator, defines a
40 '   generator (a series of lines that redefine each straight
50 '   line, but with no difference to the area), then redraws
60 '   the map each time at a finer level of detail.
70 '
80 '*********************************************************
90 '
100 DEFINT A-Z:KEY OFF
110 DIM P(2500,3,1)
120 DIM RI(4),RJ(4)
130 GOSUB 4000 'setup data
140 B=4:GENERATOR$="FLRRFLLR"  'forward, left, etc
150 S1=0:S2=1:C=1
155 KEY OFF:SCREEN 1,0:CLS
160 LINE (P(1,1,0),P(1,2,0))-(P(3,1,0),P(3,2,0)),C,B
180 FOR L=1 TO 3
181 C=C+1:IF C>3 THEN C=1
185 GOSUB 1000 'draw another level of detail
190 IF S1=0 THEN S1=1 ELSE S1=0
200 IF S2=0 THEN S2=1 ELSE S2=0
210 NEXT
220 X$=INPUT$(1)
290 END
300 '
1000 '************************************* draw a level of koch curve
1005 '
1010 N=1
1015 UNIT=ABS(P(1,1,S1)-P(2,1,S1))/B 'unit length
1016 IF UNIT=0 THEN UNIT=ABS(P(1,2,S1)-P(2,2,S1))/B 'unit length
1020 FOR N=1 TO NPTS
1030 I=P(N,1,S1)
1040 J=P(N,2,S1)
1050 DIR=P(N,3,S1)
1060     FOR K=1 TO LEN(GENERATOR$)
1070     X$=MID$(GENERATOR$,K,1)    'get next command from generator
1080     IF X$="L" THEN DIR=DIR-1:IF DIR<1 THEN DIR=4
1085     IF X$="R" THEN DIR=DIR+1:IF DIR>4 THEN DIR=1
1090     NXI=I+RI(DIR)*UNIT  'offset to next point
1095     NXJ=J+RJ(DIR)*UNIT
1100     LINE (I,J)-(NXI,NXJ),C
1110     P(N,1,S2)=I
1112     P(N,2,S2)=J
1114     P(N,3,S2)=DIR
1115     I=NXI:J=NXJ
1120     N=N+1
1130     NEXT K
1140 NEXT N
1150 NPTS=N
1990 RETURN
2000 '
4000 '************************************* setup
4005 '
4010 FOR I=1 TO 4:READ RI(I):NEXT
4020 FOR I=1 TO 4:READ RJ(I):NEXT
4030 DATA    1,0,-1,0,     0,1,0,-1
4040 FOR I=1 TO 4:READ P(I,1,0),P(I,2,0),P(I,3,0):NEXT  'x, y, direction
4050 DATA 100,35,1,  228,35,2,  228,163,3,  100,163,4 :' center initial square
4060 NPTS=4 'current number of points
4090 RETURN
```

Figure 1: *KOCH.BAS curve generator.*

sion," or more simply "fractal."

As with so many other mathematical topics, only a few years ago it took the equivalent of a Cray supercomputer to do the research. Now it's possible to investigate these ideas on the IBM PC. Although you won't be able to create a model of the Grand Canyon with all its layers, you can still examine how such models work and create interesting PC landscapes.

The PC is orders of magnitude away from the bigger machines. In its highest-resolution mode, it can handle only 640 × 200 dots, or "pixels." Standard video commonly uses 512 × 512 pixels, while 70mm film requires 4,000 × 6,000. That's 24 million pixels, or about 3 megabytes of data, per frame. Even on mainframes, a hard disk pack can store only about 256 megabytes or about 80 frames of pictures, which yields only about 3 seconds worth of animation.

Regular Irregularities

Koch curves are a class of curves that can be used for a crude simulation of non-

The best buy you'll ever find!

Nashua™ Diskettes

LIFETIME WARRANTY!

5¼" SSDD .99¢ ea. Qty 50

5¼" DSDD $1.09 ea. Qty. 50

(These are poly-bagged diskettes with reinforced hubs, Tyvek sleeves, user identification labels and write-protect tabs.)

SOFT SECTOR ONLY!
Sold in multiples of 50 only.
Prices good while sale quantities last.

INTRODUCTORY SPECIAL!
NASHUA Corporation is a half-billion dollar corporation and a recognized leader in magnetic media. You've used these diskettes before and didn't know it...since Nashua has sold primarily to software duplicators

SUPER SPECIAL!

Order 50 NASHUA Diskettes on this special offer and you can get an Amaray Media Mate 50 for only $9.99 (shipping included). Normally, a $14.95 retail value, this is one of the best designed disk storage units we've seen. Special slots and ridges for stacking. A great buy.

With 50 NASHUA 5¼" Diskettes $9.99

Ordered alone: $10.95 + $2.00 Shpng.

3M HEADCLEANING KITS
Stop swearing and start cleaning. This non-abrasive cleaning kit has everything you need for 30 applications. $18.00 + $1.50 Shpng

DISKETTE 70 STORAGE: STILL A GREAT BUY
Dust-free storage for 70 5¼" diskettes. Six dividers included. An excellent value. $11.95 + $3.00 Shpng

DISK CADDIES
The original flip-up holder for 10 5¼" diskettes. Beige or grey only.
$1.65 ea. + 20¢ Shpng

PRINTER RIBBONS AT BARGAIN PRICES!
Brand new ribbons produced to manufacturer's specs

Epson MX-70/80	$3.58 ea.	+ 25 Shpng
Epson MX-100	$6.99 ea.	+ 25 Shpng
Okidata Micro 83	$1.48 ea.	+ 25 Shpng
Okidata Micro 84	$3.66 ea.	+ 25 Shpng

Shipping: 5¼ DISKETTES—Add $3.00 per 100 or fewer diskettes. Other Items: Add shipping charges as shown in addition to diskette shipping charges. Payment: VISA and MASTERCARD accepted. COD orders only, add $3.00 handling charge. Taxes: Illinois residents only add 8% sales tax

MINIMUM ORDER: $35.00

FOR ORDERS ONLY:
1-800-621-6827
(In Illinois 1-312-944-2788)

INFORMATION & INQUIRIES:
1-312-944-2788 only!
HOURS 9AM - 5PM Central Time, Monday - Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Distributor NASHUA MAGNETIC MEDIA

CIRCLE 143 ON READER SERVICE CARD

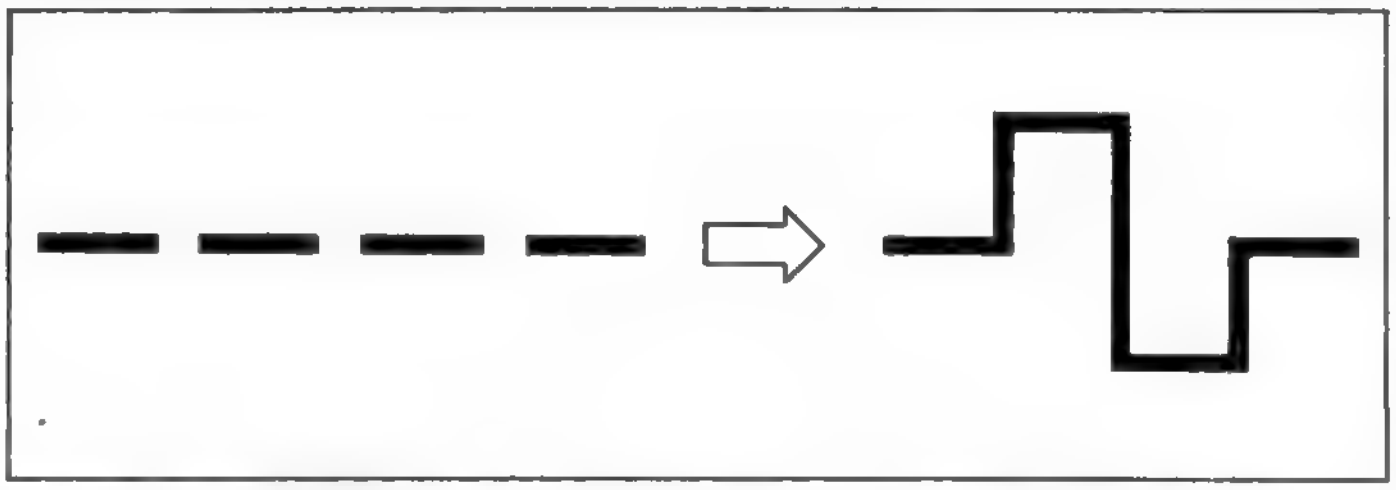


Figure 2: *Construction of the curve generator used in the program listed in Figure 1.*

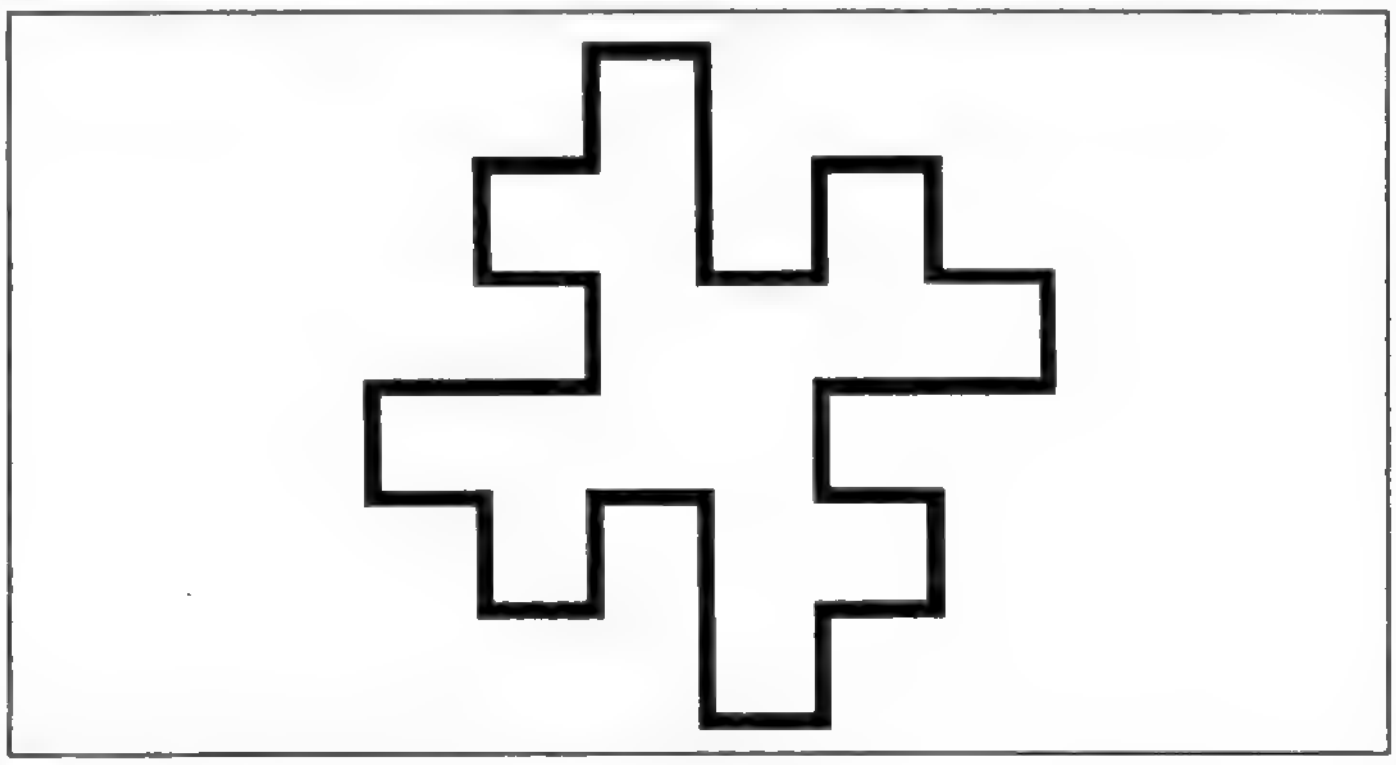


Figure 3: *A first-generation Koch curve achieved by applying the generator shown in Figure 2 to four sides of a square.*

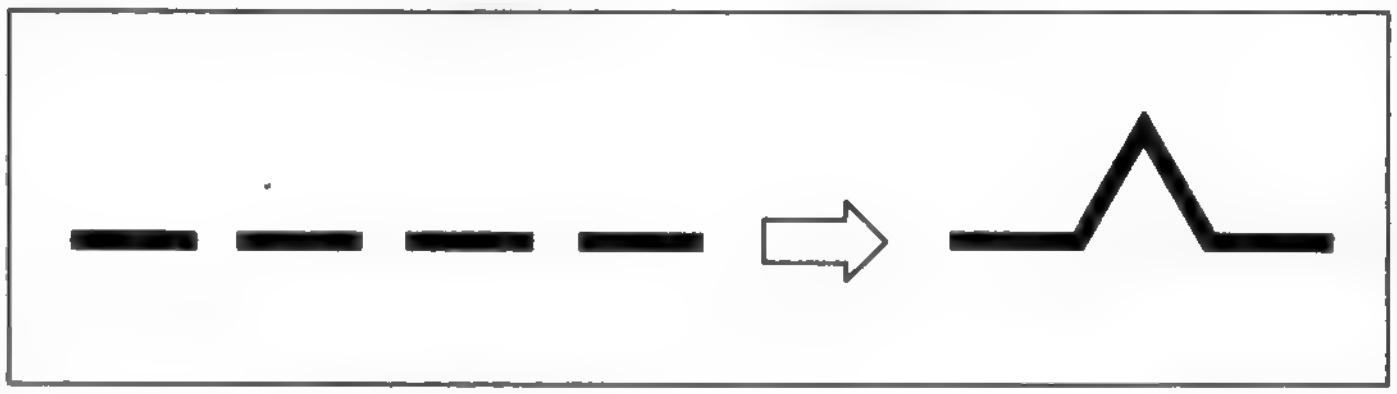


Figure 4: *Generator for the program in Figure 1 using a non-square initiator.*

linear polygons. They are formed by repeated application of a set of rules to each side of a polygon. In each repetition, the number of sides on the polygon increases, the sides become smaller, and the detail finer until the limit of the display's resolution is reached. (The display can be anything from a pen-and-ink construction to a high-quality CRT.)

A program to create a Koch curve is shown in Figure 1. It starts with a square called an *initiator*, which can be any polygon or curve. Usually the initiator is a regular polygon such as a square, equilateral triangle, or hexagon. Then the program designs a *generator* or a set of rules for changing each line of the initiator. The program in Figure 1 uses a generator that says "go forward ¼, turn left ¼, then right, right, forward, left, left, and right." This will take a line, divide it into four segments, and change it as shown in Figure 2. This is repeated for each side of the square, yielding the shape in Figure 3.

Next, each new side is broken into four sections, and the generator is applied to these. While in theory this process can continue indefinitely, we quickly reach the limits of the PC's resolution. Note that in this version of the generator, the area above the initial line in Figure 2 is the same as the area below. This means that however many times the generator is applied to the pattern, the area will stay the same. However, the circumference will continue to increase.

The KOCH.BAS program in Figure 1 allows testing of various generators. The initial square is set to maximize the number of generations that will appear on the screen. It is a square measuring 128 × 128 pixels, with coordinates that are initialized in lines 4040–4050. P( ) is a three-dimensional array, defined as P(2500,3,1), that lists the line segments.

The first dimension lists the segments in order, so P(34,i,k) would refer to the 34th segment. The second dimension has three elements. P(i,1,j) refers to the horizontal pixel coordinate of the i'th segment. P(i,2,j) refers to the vertical coordinate, and P(i,3,j) stores the direction of that line segment, where 1 is east, 2 is south, 3 is west, and 4 is north.

As the program constructs the curve, it must store the new line segments before it reads the old line. The simplest way to do this is to keep two lists. On the first pass, it reads line segments from list 1 and stores the new (and longer) list in list 2. Then it reads list 2 and stores the new list in list 1. To simplify programming, I set up the third element of the P( ) array to act as a pointer. The two lists are contained in the array P( ) and are switched back and forth as the iterations proceed. Thus P(i,j,S1) will read the i'th line segment for the pass and store the resulting values in P(k,j,S2). When the pass is complete, the values of the switches S1 and S2 are swapped.

An initial routine sets up the starting position and defines the relative *x* and *y* movements for each of four directions. For example, to move in direction 2, just add RI(2) to the current *x* and RJ(2) to the

current y. The program then defines a generator and makes three passes at drawing the square, using a finer level of detail with each pass.

Each pass calls the subroutine starting at line 1000. First, the subroutine calculates the unit length of the current line segments (in lines 1015–1016). It then examines each current line segment (in lines 1020–1140). The generator is applied to the line segment, one command at a time (lines 1060–1130).

Three commands are possible: go forward, turn left, or turn right. When a command for a turn is found, the turn is executed and the line segment drawn, so "L" really means turn left and go forward. For each line command the new x and y positions are calculated (in lines 1090–1095), the new line is drawn, and the new list is updated to include the new endpoint (in lines 1110–1115). Each pass of the subroutine starts with an array of NPTS points. While the subroutine operates, a new array is built with M elements. At the end, NPTS is set to M (in line 1150).

You can experiment with the program in Figure 1 to produce other Koch curves. For example, try the generator "LRRLRLLR" or "LFRRFLRFLLFR" in place of the existing one in line 140. Further projects could test the results of generators that divide the line into three or eight parts. (In this case, be sure to set B in line 140 to the number of line segments.) Or you could rewrite the program to use triangles or hexagons as initiators. If you experiment with such initiators, however, you'll need commands other than F, L, and R. You might want to have generators that use angles like the ones pictured in Figure 4.

Koch curves give some insight into the problems of measuring fractal objects, but they are completely predictable—each level is exactly like the one before. This property is called self-similarity. Natural objects are not exactly self-similar, but they are statistically self-similar. If we sample different areas at different magnifications, we can describe average forms for these natural objects. This statistical feature is the key to a sophisticated fractal algorithm that will be covered next issue. ■

Stephen Estvanik is an independent consultant and programmer who specializes in scientific applications and microcomputers.

Introducing CarryOn, a $38 portable and computer-based name and address telephone directory:

an original combining form and function.

Russian Incense Burner
17th Century

CarryOn is a $38 portable and computer-based name and address telephone directory. It combines the precision and speed of a computer with the ease and comfort of a handsome and portable accessory. The CarryOn System is a complete package including an elegant leather-simulated binder, high-quality stationery, and directory management software.

CarryOn is a powerful and flexible data organizer. It can add, modify, delete and cross-classify directory entries across twenty different user-defined categories. From "Work" and "Clients" to "Home" and "Entertainment," each separate section can be defined to match your own special needs.

The CarryOn program is menu-driven and self-explanatory. Its screens and User's Guide spell out simplicity and ease of use, and an interactive help message is always one keystroke away.

With CarryOn, you'll no longer worry about losing your directory or having to copy it anew when it wears out. The CarryOn System can print out a whole directory and any of its parts in a matter of minutes, and extra stationery and additional binders may be reordered at any time, directly from CarryOn Systems Corporation.

If your current name and address book can no longer take it—you need the CarryOn System. Once printed and bound, the CarryOn Directory can be used in the office, at the home, or on the road. It is one name and address telephone directory you'll be proud to carry with you.

TOLL-FREE ORDERS:
(24 hours a day, 7 days a week)
1-800-85-CARRY
1-800-852-2779
(In PA, dial: 215-925-6290)

Send check or money order for $38., plus $3. for shipping and handling to:
CarryOn Systems Corporation
P.O. Box 58849 • Philadelphia, PA 19102

CarryOn™

A Computer Program So Advanced, You Barely Need A Computer To Use It.

CarryOn is available for the IBM-PC and the APPLE II series.
Please specify computer model.
PA residents add 6% tax.

Dealers Inquiries welcome

CarryOn is a trademark of CarryOn Systems Corporation
Apple is a registered trademark of Apple Computer Inc.
IBM is a registered trademark of IBM Corporation

CIRCLE 217 ON READER SERVICE CARD

magnum p.c.

800-544-4354

MasterCard — GA Residents (404) 441-3112 — VISA

4056 WETHERBURN WAY SUITE 205 ATLANTA GA 30092

PRINTERS

RITEMAN 3" TALL - LIKE EPSON BUT FASTER ..... BEST PRICE
C. ITOH LETTER QUALITY ..... CALL
OKIDATA ALL MODELS ..... CALL
NEC SPINWRITERS, P2 & P3 ..... CALL
EPSON MX, FX, RX ..... CALL
STAR MICRONICS ..... SAVE
TOSHIBA P1351 & P1340 ..... CALL
SILVER-REED ..... SAVE

DISK DRIVES

TANDON TM100-2 199
TM65 ½ HEIGHT 185
10 MEG HARD 1440
HALF HEIGHTS (FOR IBM) ..... FROM 155
QUADDISK 6 MEG REMOVABLE ..... CALL
TECMAR 5 MEG REMOVABLE ..... CALL
MICRO SCI (FOR APPLE) ..... CALL
QUENTIN (FOR APPLE & IBM) ..... SAVE
TALLGRASS HARD DISK WITH BACKUP ..... CALL
IOMEGA BERNOULLI BOX (20 MEG) ..... CALL
SHUGART HARD DISKS & CONTROLLERS ..... SAVE
EVEREX 10 MEG INTERNAL HARD DISK 950
PEACHTREE PERIPHERALS ..... CALL
TEAC 1/2 HT STREAMERS & HARD DISK ..... NEW
PCjr 2ND DISK DRIVE OR HARD DISK ..... CALL

COMPUTERS

COMPAQ ..... CALL
IBM PC YOU CONFIGURE ..... CALL
SANYO MBC ..... NEW LOW PRICES
TAVA PC ..... MORE PC FOR LESS

BOARDS

QUADRAM ALL PRODUCTS ..... CALL
AST SIX PAC PLUS ..... 275 PERSYST ..... CALL
IRMA 3278 EMULATOR ..... BEST PRICE
HERCULES GRAPHICS CARD ..... CALL
TECMAR ALL PRODUCTS ..... CALL
IDEASSOCIATES ALL PRODUCTS ..... CALL
STB GRAPHIX PLUS II ..... CALL
PCjr MEMORY EXPANSION (UP TO 512K) ..... CALL
TITAN TECHNOLOGIES (FOR APPLE OR IBM) ..... NEW
ACCELERATORS FOR IBM OR APPLE ..... CALL

MONITORS

TAXAN 116 AMBER / 115 GREEN 137/131
410 - 415 RGB HI RES ..... CALL
420 - 425 RGB SUPER HI RES ..... CALL
440 ULTRA HI RES ..... CALL
AMDEK ..... CALL
QUADRAM QUADCHROME ..... CALL
PRINCETON GRAPHICS ..... SAVE

SOFTWARE

LOTUS 1-2-3 ..... SAVE MULTIMATE ..... CALL
KNOWLEDGEMAN ..... CALL 10 BASE ..... CALL
D-BASE III ..... 455 SYMPHONY 475
WORDSTAR ..... CALL SUPERCALC 3 229

MODEMS

NOVATION - ACCESS 1-2-3 W/CROSSTALK XVI ..... CALL
HAYES SMART MODEM 300/1200 ..... 212/499

ACCESSORIES

SWITCH BOXES PARALLEL & SERIAL ..... SAVE
CHIPS 64K 49
MICROFAZER PRINT SPOOLER ..... FROM 127
COMPUSERVE STARTER KIT 32

DISKETTES

	CASE 100	BOX 10
VERBATIM SS/DD	180	24
DS/DD	300	36

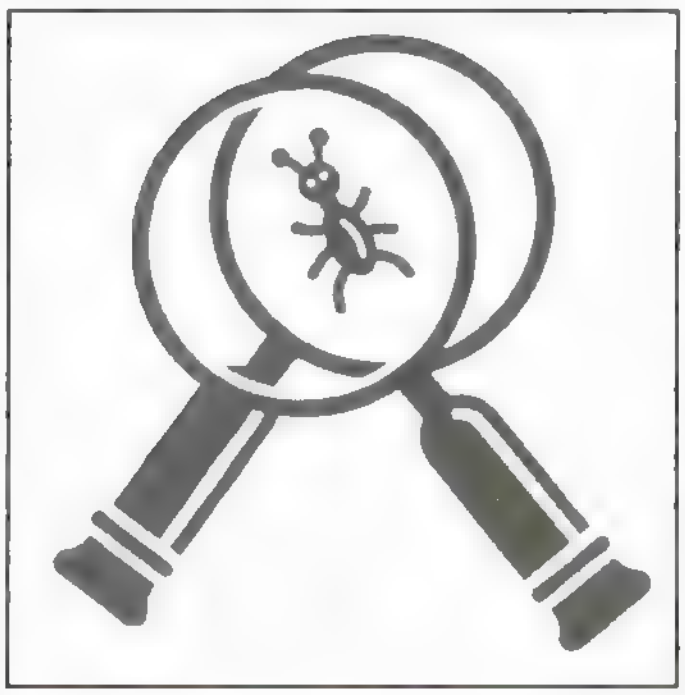
AVAILABILITY AND PRICES SUBJECT TO CHANGE
APPROVED CORPORATE ACCOUNTS WELCOMED

384 CIRCLE 386 ON READER SERVICE CARD

EDITED BY PAUL SOMERSON

User-to-User

PC readers use this forum to help one another by passing along their questions, solutions, comments, and complaints.



Repeat Performance

In my work helping business users of IBM PCs, I have found that not enough users have discovered the F3 key. This key can be used while in DOS to repeat the last command, a great time-saving trick. It works because the operating system maintains a template that saves the last DOS command you typed. The template is displayed when you hit the F3 key; you can then use it as all or part of your next command.

But there's another interesting and little-used trick with the F3 key. Usually when you want to repeat a command, it's not the last command, but the one before that. For instance, often a problem will occur because you were in the wrong place when you tried a command the first time. Either the logged disk drive was B: instead of A: or you were in a subdirectory instead of the root directory. Unfortunately, it takes a DOS command to move to the right place (either A: to switch the logged disk drive, or CD to change the current directory). This command becomes the one stored in the template, so that you lose the command you wanted to repeat.

It would be nice if you could repeat the DOS command just prior to the last one. You can do this on UNIX. In fact, UNIX keeps a session log of all your DOS commands and allows you to reuse any of them. Well, yes, Virginia, there is a Santa Claus.

Let's say your initial command is:

```
COPY AUTOEXEC.BAT
B:AUTO2BAT.LIB
```

but it doesn't work because you were logged onto drive B: instead of drive A: where AUTOEXEC.BAT is located. To change the logged disk drive and still retain the first command in the template for later use, do this:

1. Press the Ins key and type A: (this inserts A: into the template).
2. Hit the spacebar.
3. Hit the F3 function key, then hit the Enter key.

DOS now executes this line:

```
A: COPY AUTOEXEC.BAT
B: AUTO2BAT.LIB
```

but DOS sees only A:, the first command on the line, since there is a space after it. DOS makes sense out of that and simply looks no further.

To retrieve the initial command, trim the template using the Del key. Simply hit the Del key twice, once for each character

in A:. Then hit F3, and you've got the initial command back again to execute just by hitting the Enter key:

```
COPY AUTOEXEC.BAT
B:AUTO2BAT.LIB
```

Kendall Callas
San Francisco, California

The F3 key is a valuable tool, and this twist makes it even better. It would be awfully handy if there were a way of doing this in BASICA as well. Does anyone know a PEEK or other technique for retrieving the last BASICA command? If so, the instruction could be hooked into a function key to allow BASICA programmers to save lots of steps.

Patching Typing Tutor

After reading Gary Kaplan's article ("Bye-Bye Qwerty," *PC*, Volume 3 Number 1), I decided to experiment with the Dvorak keyboard layout using *Pro-Key*'s LAYOUT command. Never having used Dvorak before, I decided to use IBM's *Typing Tutor* to learn the layout. *Typing Tutor*, however, teaches only the Qwerty layout.

I then examined one of *Typing Tutor*'s subprograms, TT.BAS, and I found a way to modify the program for the Dvorak layout. First, start with an unused copy of *Typing Tutor* (once the disk is used, information on student progress added to the disk limits users to the Qwerty sequence). DISKCOPY it to a blank formatted disk, which will become the working copy of *Typing Tutor* for the Dvorak layout only. Next, prepare the working copy as explained on pages 11 and 12 of the user manual. Then, insert the working copy in drive A:, and load BASIC. From BASIC, load TT.BAS. Then change the lines in Figure 1, and save TT.BAS.

Jeff Gealow
McHenry, Illinois

All typing tutor programs should have this option—it's only a handful of lines. An instructional disk is just the thing if you

Call ELEK-TEK for

UNBELIEVABLE PRICES!!

on

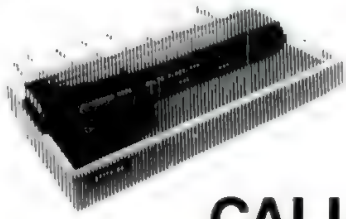
EPSON PRINTERS

80 COLUMN PRINTERS

RX-80 ..... 235.00
RX-80FT. 275.00
FX-80 ..... 390.00

132 COLUMN PRINTERS

RX-100 ..... 390.00
FX-100 ..... 590.00



NEW Near Letter Quality PRINTER

LQ 1500 200/67 c.p.s. Tractor/Friction ..... CALL

CABLES/ACCESSORIES

Cables for Epson

CB5622 10 ft. 36/36 pin standard parallel	32.00
CB5609 10 ft. 36/25 pin parallel for IBM	25.00
CB5618 6 ft. 36/16 pin parallel for TI-99/4A	25.00
CB5629 10 ft. 25 pin standard RS-232 (fully loaded)	25.00
CB5620 6ft. parallel for TRS 80 Model I-III-IV	22.00
RS1Y RS-232 Y cable for TI-99/4A	25.00

Interfaces

CARDCO G	65.00
APPLE DUMPLING GX	65.00
GRAPPLER PLUS	105.00
Buffered (16K) GRAPPLER PLUS	165.00
8148 Ser. (For RX or FX Models)	90.00
8161 IEEE-488 Interface	60.00

Ribbon Cartridges

DPR 192 For EPSON 80 col. printers	4.00
DPR 193 For EPSON 132 col. printers	6.00
Elek-Tek Dust Covers available for most models	5.00

CORP. ACCTS. INVITED. MIN. ORD. $15.00 MasterCard or Visa by mail or phone. Mail Cashier's Check, Money Ord., Pers. Check (2 wks. to clr.) Add 94 for item (AK, HI, P.R., CANADA ADD $10.00 FIRST ITEM) $1.00 ea. add'l. shpg. & handl. Shipments to IL address add 7% tax. Prices subj. to change WRITE FOR FREE CATALOG. RETURN POLICY: Replacement only for defective on arrival. Thereafter, MFR. Warranty applies. All ELEK-TEK MERCHANDISE IS BRAND NEW, FIRST QUALITY AND COMPLETE

ELEK-TEK, inc. 6557 N. Lincoln Ave., Chicago IL 60645 (800) 621-5300 (312) 677-7600

CIRCLE 151 ON READER SERVICE CARD

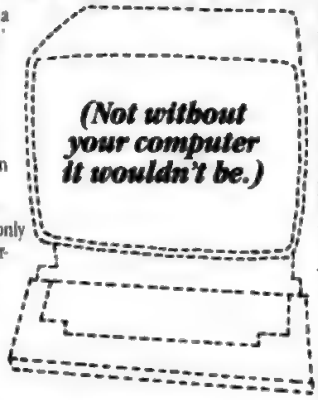
Business as Usual?

Business as usual these days means a computer that's up and "humming." But if your computer were stolen or damaged, you wouldn't have business as usual.

YOU'D HAVE TROUBLE!

You can get fast replacement for your entire system and be back in business in a hurry by protecting your computer with SAFEWARE Personal Computer Insurance. It's the only coverage designed specifically for personal computers used for business —in your office, shop or home.

SAFEWARE protects ALL hardware, ALL purchased software and ALL media against theft, accidental damage, natural disaster, power surge, etc., regardless of use, after a low $50 deductible.



Fast, courteous claims handling prevents your losing valuable business computing time.

Find the premium price for the coverage you need listed in the table below, *available for as low as $35 per year.* Fill in the coupon today. Your coverage will begin as soon as your payment is accepted. Or, for even faster coverage, call our toll-free number

1-800-848-3469
(In Ohio call 1-614/262-0559)
Phones open 8 a.m. to 8 p.m. Monday through Saturday

SAFEWARE

Total Hardware, Media & Software System Value	Annual Premium
Up to $ 2,000	$ 35
$ 2,001-$ 5,000	$ 60
$ 5,001-$ 8,000	$ 75
$ 8,001-$11,000	$ 90
$11,001-$14,000	$105

Call toll-free for rates on higher coverage
Coverage differs in Texas
It is an underwriting requirement that you insure your system for its full value
Call for student rates.

Mail to: SAFEWARE, P.O. Box 02211, Columbus, OH 43202

Before I'm out of business,
please issue my SAFEWARE Insurance Coverage

Name _____
Street _____
City _____ State _____ Zip _____
System value $ _____ ☐ Check Enclosed ☐ VISA ☐ MasterCard
Card # _____ Exp. Date _____
Signature _____

No risk. You may return contract for full refund within 10 days. Coverages and limits are subject to the terms, conditions and exclusions in the contract

PCM

```
Figure 1:  Patches to IBM's Typing Tutor for Dvorak layout.

Replace line:
3230 KB$="asdfjkl;eiruvoqpghtyvmbnc,x.z/4738291056:'"+CHR$(34)+"$&#*@(!)%^<>"
with:
3230 KB$="aoeuhtns.cpg,r/lidyfkmxbjwqv;z1234567890:-_!@##%^&*()<>"

Replace line:
3235 KB$=KB$+"[]?-=()_+\|'~"
with:
3235 KB$=KB$+"']?=["+CHR$(34)+"}+{\|'~"

Replace line:
3240 KC$="        dkfjsla;fjrufjvmdksla;fjdksla;47;;"+  "'"   +"4738291056,."
with:
3240 KC$="        etuhonasuhpguhkmetonasuhetonas12ss"+  "-"   +"1234567890vv"

Replace line:
3245 KC$=KC$+"p[;0-[]-=a\'`"
with:
3245 KC$=KC$+"l's8=']=[a\-`"
```

Figure 1: *This program patches IBM's* Typing Tutor *to a Dvorak keyboard layout.*

```
100 'MULTI.BAS -Multiplication of long numbers-Max Chandivert-840602
110 CLS:KEY OFF:WIDTH 80:OPTION BASE 1:DEFINT A-Z:DIM C$(255),L(255)
120 INPUT "Enter first number: ",AI$
130 INPUT "Enter second number: ",BI$
140 FLAG=0:IF LEFT$(AI$,1)="-" THEN FLAG=1 ELSE GOTO 170
150 IF LEFT$(BI$,1)="-" THEN FLAG=0
160 GOTO 180
170 IF LEFT$(BI$,1)="-" THEN FLAG=1
180 IF LEFT$(AI$,1)="+" OR LEFT$(AI$,1)="-" THEN AI$=RIGHT$(AI$,LEN(AI$)-1)
190 IF LEFT$(BI$,1)="+" OR LEFT$(BI$,1)="-" THEN BI$=RIGHT$(BI$,LEN(BI$)-1)
200 IN=INSTR(1,AI$,".") 'record position of decimal point if present
210 IF IN=0 THEN 230
220 INA=LEN(AI$)-IN:AI$=LEFT$(AI$,IN-1)+RIGHT$(AI$,INA)
230 JN=INSTR(1,BI$,".")
240 IF JN=0 THEN 260
250 JNB=LEN(BI$)-JN:BI$=LEFT$(BI$,JN-1)+RIGHT$(BI$,JNB)
260 IF IN=0 THEN INA=0
270 IF JN=0 THEN JNB=0
280 IJ!=INA+JNB
290 IF LEN(AI$)<LEN(BI$) THEN 300 ELSE 310 'place shorter number as multiplier
300 A$=BI$:B$=AI$:GOTO 320
310 A$=AI$:B$=BI$
320 LA=LEN(A$):LB=LEN(B$):LC!=LA+LB:IF LC! >252 THEN BEEP
330 PRINT "# of digits in both numbers =";LC!
340 PRINT "# of decimal places in both numbers =";IJ!
350 FOR I=LB TO 1 STEP -1 'multiply multiplicand by each digit of multiplier
360 BUF=0:NB=VAL(MID$(B$,I,1))
370 FOR J=LA TO 1 STEP -1
380 NA=VAL(MID$(A$,J,1)):NC=NA*NB +BUF:NC$=STR$(NC)
390 IF LEN(NC$)=2 THEN BUF=VAL(LEFT$(NC$,1)) ELSE BUF=VAL(LEFT$(NC$,2))
400 NC$=RIGHT$(NC$,1):C$(I)=NC$+C$(I):IF J<>1 THEN 420
410 C$(I)=STR$(BUF)+C$(I)
420 NEXT
430 L(I)=LEN(C$(I))
440 NEXT
450 BUF=0:IND=0:P$="" 'addition of intermediate products
460 FOR N!=1 TO LC!
```

(Figure 2 continues)

Figure 2: *You can use this program to multiply numbers up to 252 digits each. Compile it for faster results when working with two extremely long numbers.*

(continued)

```
470 SUM=0
480 FOR K=0 TO LB-1
490 P=LB-K:M!=L(P)-N!+K+1:IF (M!<1) OR (M!>253) THEN 510
500 SUM=SUM+VAL(MID$(C$(P),M!,1))
510 NEXT
520 SUM=BUF+SUM:SUM$=STR$(SUM):LSUM=LEN(SUM$)
530 BUF=VAL(MID$(SUM$,LSUM-1,1)):P$=RIGHT$(SUM$,1)+P$
540 IF (LC!-N!<254) THEN 560
550 P$="":IND=IND+1
560 NEXT
570 IF IJ!>IND THEN IJ!=IJ!-IND ELSE IJ!=0 'restore decimal point
580 LC!=LC!-IND:P$=LEFT$(P$,LC!-IJ!)+"."+RIGHT$(P$,IJ!)
590 IF LEFT$(P$,1)="0" THEN P$=RIGHT$(P$,LEN(P$)-1) 'delete a leading zero
600 IF FLAG=1 THEN P$="-"+P$ 'restore minus sign
610 BEEP:PRINT:PRINT "PRODUCT=";P$
620 PRINT:PRINT "Want to calculate another product (Y/N)?"
630 Q$=INKEY$:IF Q$="" THEN 630
640 IF Q$<>"Y" AND Q$<>"y" THEN 660
650 CLEAR:GOTO 110
660 END
```

(Figure 2 ends)

```
100 ' MAKEMONO.BAS -- Creates MONO.COM -- by Joe Mocker
110 PRINT "Creating MONO.COM (which disables color) ..."
120 OPEN "MONO.COM" FOR OUTPUT AS #1
130 FOR CNT=1 TO 10:TOT=0
140 FOR SUB=1 TO 12:READ CUR:TOT=TOT+CUR
150 PRINT #1,CHR$(CUR);
160 NEXT:READ CUR:IF TOT<>CUR THEN 190
170 NEXT:FOR R=1 TO 8:PRINT #1,CHR$(0);:NEXT
180 CLOSE 1:PRINT :PRINT "MONO.COM created.":END
190 PRINT "BAD DATA IN LINE"49990!+10*CNT:BEEP:END
50000 DATA 235,89,144,1,0,80,83,81,82,30,250,186,1261
50010 DATA 218,3,236,169,8,0,116,250,176,37,186,216,1615
50020 DATA 3,238,46,139,30,3,1,184,0,184,142,216,1186
50030 DATA 176,15,185,80,0,138,39,128,252,7,116,2,1138
50040 DATA 136,7,67,67,224,243,184,64,0,142,216,83,1433
50050 DATA 187,101,0,138,7,186,216,3,238,91,31,129,1327
50060 DATA 251,162,15,126,3,187,1,0,46,137,30,3,961
50070 DATA 1,251,90,89,91,88,207,250,30,51,192,142,1482
50080 DATA 216,190,112,0,184,5,1,137,4,70,70,140,1129
50090 DATA 200,137,4,31,251,186,91,1,205,39,0,0,1145
```

Figure 3: *This MAKEMONO.BAS program creates a MONO.COM utility to disable color when using a color graphics board with a monochrome monitor.*

IBM ® PC/XT
Compatible Disk Drives

DISK DRIVES WEST of California has purchased a large quantity of 100% IBM ® compatible half height floppy disk drives and is offering them to the public at UNBELIEVABLY LOW PRICES!

- *High quality 100% PC or XT compatible*
- *100% tested before shipment*
- *Double-Sided/Double-Density 48 TPI*
- *30 day return or replacement policy*

$149.00 ea.

—BRAND NEW — NO SECONDS — NAME BRAND MANUFACTURER

DISK DRIVES WEST
14252 Culver Drive, Suite A-355
Irvine, CA. 92714
Phone 714-660-7030

TERMS: MC, VISA, Prepaid (no personal checks) or C.O.D. certified check. Add $3.50 for postage and handling. CA residents add sales tax.

APPLE ® ½ High Compatibles — W/Case also available — $119.00 + P&H

CIRCLE 163 ON READER SERVICE CARD

COMPLETE YOUR LIBRARY OF PC

Add to your PC collection today. Make your personal library complete and authoritative with any issues you may be missing.

Copies are available for issues published during the last twelve months—be sure to specify the issues you want. If a particular issue is out of stock, your payment will be refunded promptly.

Back issues of PC are priced at $6.00 each, postpaid. Outside USA, $7.00 each.

PC MCBI
CN 1914 Morristown, NJ 07960
Please send issues of PC listed below:

Issue	Qty.	Unit Price	Total Price
Payment Enclosed			$

Mr./Mrs./Ms. _____ (print full name)
Address _____
City/State/Zip _____

want to make the difficult switch from Qwerty to Dvorak.

Fantasy on Strings

The numbers the PC can handle are limited in size by the way in which the PC stores digits. Under the Intel format the maximum number of significant digits in double precision is 16. Under the IEEE format using the 8087, the maximum is 20 in temporary real format.

At times, you might want to manipulate numbers with many more digits—when dealing with number theory, evaluating limits, or doing cryptography, for example. The PC has the necessary logic; the only problem is storage.

The MULTI.BAS program (see Figure 2) can help your PC multiply two numbers of up to 252 digits each. The scheme used here enters the numbers as strings rather than numerical constants. The program then manipulates the digits one at a time. It transforms each one into a number and processes it arithmetically. The result is retransformed into characters, to be stored in a string again. The limit of 252 digits is set so that each number (multiplicand or multiplier) can fit into string storage, allowing for a possible plus or minus sign, a possible decimal point, and the leading byte, which indicates string length.

When you multiply two numbers of such length, the product may sometimes exceed the maximum string length allowed. In that case, the program beeps just before printing LC, the total number of digits in both entries, and IJ, the total number of digits the result will have to the right of the decimal point. The program performs the multiplication without truncating the product, but it does not enter digits into the string, storing the product until it's no longer than 252 characters. When you have one long and one short number, the program works fairly quickly. When you have two long numbers, using a compiled version of the program is preferable.

Though not a programming model, MULTI.BAS shows how useful for computations the BASIC string-handling facilities in the PC can be.

Max G. Chandivert
Huntingdale, Australia

True enough. If you try this, do compile it; it really flies.

Color Killer

Many computer owners have a color graphics board, but use it with a green or other single-color screen. They find some programs just about impossible to use because the color isn't a combination of white and black. MONO.COM, created by the MAKEMONO.BAS program in Figure 3, continuously scans the first page of screen memory, changing any attribute that isn't white on black to high-intensity white on black. This operation can be done because interrupt 1C is called each time the clock ticks. At power-up this interrupt is initialized to do nothing, but after this program is installed, the interrupt saves all registers and segments used, turns off the screen, scans 80 characters and changes accordingly, turns the screen back on, and then restores all registers and segments saved.

Joe Mocker
Goleta, California

There are indeed times when you cannot read color on a noncolor screen. Short of going into someone else's code and changing all the attributes, this method is the best solution to the problem. Note: If you want a normal white foreground rather than high-intensity white, change the 15 to 7 and the 1138 to 1130 in the DATA statement in line 50030.

Share Your Discoveries

Tell the world about your latest discovery through User-to-User, and we'll pay you $50 for your trouble, *plus an extra $25 if you submit it on a disk.*

If you send a disk, please include a printout of your submission to ensure against damage. Mail your contributions to: User-to-User, *PC Magazine*, One Park Avenue, New York, NY 10016. ■

MARK ZACHMANN

PC Tutor

How Compatible?

Q: After having my Corona PC for about a year, I've run into the problem of IBM incompatibility for the first time. The problem: the IBM PC has an open socket

for an additional ROM or EPROM chip, while the Corona PC has only one EPROM socket, which already holds a chip with the BIOS.

A few programs now on the market—including a genetics package I'd like to use—use IBM's extra socket for a specialized chip. Is there any way to use these programs on the Corona PC?

Another difference between the IBM and Corona is the way graphics are handled. For the IBM PC, you must buy a graphics card, which provides memory at dedicated addresses from B800 to BC00. In the Corona, however, graphics are handled within the standard RAM. Is there a way to modify programs that depend on the IBM Color/Graphics Adaptor so they will work on my Corona PC?

Richard Bergman
King of Prussia, Pennsylvania

A: *The ROM or EPROM in the PC's extra socket is normally located at segment address F400. If your Corona PC doesn't use memory at that address for something else, you should be able to assign it to a ROM chip connected elsewhere.*

To check whether memory is already in use at segment F400, use DEBUG as shown below to display the contents of that area. (The Corona's version of DEBUG may use DOS-style prompts (>) instead of the dashes (-) that appear on the IBM.)

```
A> DEBUG

-DF400:0
```

If you don't have any memory in use at that segment, the first DEBUG display command (DF400) should display the same value at each location in that memory area. When I ran this command, for example, many E8s appeared; on one Corona PC, FFs appeared. As long as there's consistent repetition, the value itself is arbitrary.

The next two DEBUG statements test if any RAM is present at that address.

```
-FF400:0 1400 1 2 3 4 5

-DF400:0
```

The first statement fills the first few addresses with the values 1, 2, 3, 4, and 5. The last statement reads those addresses again; if the digits you entered reappear, then RAM was available to store those numbers.

If the F400 address space is unoccupied, you still have to install a board with a ROM chip that can be called at that address. Do any readers know if such a board is available for the Corona PC?

When it comes to IBM graphics compatibility, you're probably out of luck. There are other differences besides the Corona's graphics' being movable within RAM, while the IBM's are fixed in a dedicated memory area. For example, the two computers have different resolutions and different pixel layouts for graphics.

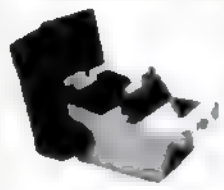
FANTASTIC LOW PRICES ON
BASF
QUALIMETRIC DISKETTES!

BASF QUALIMETRIC DISKETTES have a lifetime warranty and are packed in plastic storage cases TYVEK sleeves, reinforced hubs, user identification labels and write-protect tabs included

$1.39 ea 5¼" SSDD Qty. 20
5¼" DSDD $1.89 ea. Qty. 20

SOFT SECTOR ONLY!
3M HEADCLEANING KITS
Stop swearing and start cleaning. This non-abrasive cleaning kit has everything you need for 30 applications. $18.00 + $1.50 Shpng

AMARAY MEDIA-MATE 50: A REVOLUTION IN DISKETTE STORAGE



Every once in a while, someone takes the simple and makes it elegant This unit holds 50 5¼" diskettes, has grooves for easy stacking, nipples to keep diskettes from slipping and several other features We like it.
$10.95 ea. + $2.00 Shpng

DISKETTE 70 STORAGE: STILL A GREAT BUY
Dust-free storage for 70 5¼" diskettes. Six dividers included. An excellent value
$11.95 + $3.00 Shpng

DISK CADDIES
The original flip-up holder for 10 5¼" diskettes Beige or grey only
$1.65 ea. + 20¢ Shpng

PRINTER RIBBONS AT BARGAIN PRICES!
Brand new ribbons produced to manufacturer's specs.

Epson MX-70/80	$3.58 ea.	+ .25 Shpng
Epson MX-100	$6.89 ea.	+ .25 Shpng
Okidata Micro 83	$1.48 ea.	+ .25 Shpng
Okidata Micro 84	$3.66 ea.	+ .25 Shpng

Shipping: 5¼" DISKETTES—Add $3.00 per 100 or fewer diskettes **Other Items:** Add shipping charges as shown in addition to diskette shipping charges **Payment:** VISA and MASTERCARD accepted COD orders only, add $3.00 handling charge **Taxes:** Illinois residents only, add 8% sales tax

FOR ORDERS ONLY:
1-800-621-6827
(In Illinois 1-312-944-2788)

INFORMATION & INQUIRIES:
1-312-944-2788 only!
HOURS: 9AM - 5PM Central Time, Monday - Friday

WE WILL BEAT ANY NATIONALLY ADVERTISED PRICE ON THE SAME PRODUCTS AND QUANTITIES!

DISK WORLD!, Inc.
Suite 4806 • 30 East Huron Street • Chicago, Illinois 60611

DISK WORLD! Authorized Reseller Information Processing Media BASF

CIRCLE 143 ON READER SERVICE CARD

NEW

PC STATISTICIAN™

A POWERFUL, NEW STATISTICS PACKAGE FOR THE IBM PC

Are you tired of complicated data input and analysis specification on mainframes? Do you need data management, reports, statistics on unlimited cases? Are you ready to do professional statistics in your own office within minutes?

Let **PC STATISTICIAN™** do the work for you

EASY TO USE

PC STATISTICIAN™ is flexible and sophisticated, yet simple to use. Follow the examples in the manual, then start analyzing experimental or survey data immediately.

CHOOSES CASES AUTOMATICALLY

To get reports on your data, specify the analysis, then the variables and variable levels. If you have all of your data in a single file, **PC STATISTICIAN™** can choose the records and variables for your analysis automatically. It even handles missing data automatically

COMPREHENSIVE

You will be able to carry out virtually all of your data analysis with this one package. **PC STATISTICIAN™** includes:

Research data base
Search & select on 1-4 variables
Crosstabulation on 1-5 variables
Descriptive statistics
Frequency distribution
T-tests
1-way anova
Nonparametrics
Correlations
Curvefitting
Multiple regression
Contingency tables
Data transformations
Graphics

PC STATISTICIAN™ comes with a 10 day money back guarantee. This is the first program in The Statistics Series™ for the IBM PC. IBM PC, PC DOS, 128K, 2 DSDD Disk Drives. **$300.00**

CIRCLE 222 ON READER SERVICE CARD

HSD

HUMAN SYSTEMS DYNAMICS

To Order — Call
Toll Free (800) 451-3030
In California (818) 993-8536
or Write
HUMAN SYSTEMS DYNAMICS
9010 Reseda Blvd Suite 222/Dept P
Northridge, CA 91324

Dealer Inquiries Invited

The IBM PC's standard graphics modes provide 640 × 200 or 320 × 200 resolution. And the Corona provides 640 × 325 resolution. Even if a program is compatible with both computers, the Corona would be able to display its graphics in only the top two-thirds of its screen. By the way, the newer Corona Personal Best computers provide 640 × 400 resolution, a proportion that matches up neatly with graphics geared to IBM standards.

The most serious problem is that the IBM PC considers the highest bit in each graphics byte to indicate the leftmost pixel on the screen, while the Corona puts the lowest bit in the byte on the left. You should never assume that a graphics software package can overcome this problem unless its maker explicitly promises compatibility with the Corona PC.

Amber Forever

Q: Our office recently purchased an IBM Portable PC, but some have resisted using it because of the monitor's amber color. Is there any evidence that more eye fatigue is caused by amber screens than by green screens? Or are all differences in comfort due to individual preferences for one color over the other?

B.R. Dabbs
Sullivan, Illinois

A: *A preference for an amber or green screen is purely a matter of personal taste. In theory, the eye is more sensitive to green than red, so the green screen provides more effective contrast between foreground and background. In practice, however, many users like the amber screen because it has a moderate tone and doesn't wash out as much when under bright ambient lighting.*

Users who are accustomed to a green screen may balk at the unfamiliar amber color, but after a few days of using the new monitor, I suspect that most will get used to it. And many might eventually prefer amber screens.

I like the amber screens. In fact, I wish IBM sold an amber monochrome monitor for the desktop PC.

A Detour for Interrupts

Q: I would like to find specifications giving the contents of COMMAND.COM, ANSI.SYS, and GRAPHICS.COM. This might help me to figure out how to temporarily redirect DOS calls to my own routines and then afterward reactivate the standard operating system calls. So far, I've become very confused trying to use DEBUG to identify the DOS vector table.

Rodney E. Willard
Loma Linda, California

A: *The DOS 2.0 manual provided a good discussion of the system files; as of DOS 2.1, this information was moved into the* DOS Technical Reference *volume. A table identifying the interrupt vectors is included in the computer's* Technical Reference, *just before the section with BIOS source code listings.*

Redirecting DOS calls to other routines is a fairly simple process. All DOS calls go through INT 33, while BIOS calls go through various other interrupts (primarily INT 16 through INT 32). The hexadecimal address of an interrupt can be calculated by multiplying the interrupt number by 4. For example, the address of the Video interrupt (INT 10) is 0000:0040h.

When you want to temporarily insert your own routine at an interrupt, follow these steps: (1) Read the current 4-byte pointer at 0000:xxxx, an address calculated as explained above; (2) Place your routine's pointer (in segment:offset form) at that address, giving the offset value first; (3) Return the original pointer (found in step 1) to this address when your routine has finished processing.

Patching in Color

Q: I'd like to find an assembly language subroutine that I can insert or patch into existing applications programs so they would appear on my RGB monitor in color instead of black and white. I spend a lot

of time viewing the screen, and I'm tired of looking at that one color combination.

I've tried executing COLOR commands in BASIC before returning to DOS to invoke an applications program. The colors I set in BASIC remain on the screen while I work in DOS, but when the applications program starts running, the screen goes back to black and white.

Myron Mills
Jacksonville, Florida

A: *For consistent operations and to clear the screen before anything appears, most application programs reinitialize the screen by using the IBM PC's BIOS. This startup procedure might be the only part of the program that alters the computer's color palette.*

If the screen clears when you start the program and all subsequent characters appear in black and white, it's probable that the program rarely deals with the color settings. However, if characters with different colors ever appear during the program, the program is possibly doing too much internally with color for you to make simple changes.

For example, assume that your applications program is called PLAN.EXE and that it affects the color palette at only one spot. The following discussion should explain how to find that part of the program and to make the alterations you want.

First, make a copy of the program, rename the copy, and then load the renamed program into DEBUG:

```
A> COPY B:PLAN.EXE  A:
A> REN PLAN.EXE  PLANN
A> DEBUG PLANN
```

Next, use a DEBUG command to search for the INT 10 Video calls, which contain the code CD 10:

```
-SCS:0 LF000 CD 10
```

Suppose, for argument's sake, that this command lists three addresses, which are candidates for alteration:

```
0D95:2010
0D95:205A
0D95:2093
```

Examine each of these areas by using DEBUG's Unassemble (U) commands such as this one, which looks at the memory in the neighborhood of the first of those three addresses:

```
-U 2008
```

You don't have to enter the first four digits of the address here, since the CS value is a default used by the U command. In the output that appears on the screen, you might see some unassembled instruction like this:

```
MOV AX,5
INT 10
```

or perhaps this:

```
MOV AL,[...]
XOR AH,AH
INT 10
```

In any case where AH=0, the program executes an initialization instruction that returns the screen to its defaults. Wherever you find this sort of code, replace the INT 10 call with two NOP instructions; to do this, use the DEBUG Assemble (A) command and type in NOP twice.

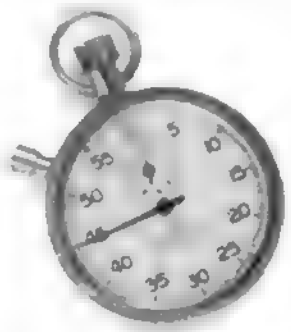
After making these changes, use the W command to write the revised file back to disk, then type Q to quit DEBUG and return to DOS.

Rename PLANN to its original name, PLAN.EXE, and try to run the program. The first few times you try changing a program, don't be surprised if the system crashes. Keep experimenting, and you'll probably find that making such changes gets easier over time.

The PC Tutor solves practical problems and explains points of general interest. If you'd like to see your questions answered here, drop a line to PC Tutor, *PC Magazine*, One Park Avenue, New York, NY 10016. ■

XyWrite II Plus.
The fastest word processor available for the IBM PC.

SAVES TIME. SAVES MONEY.



Now you can save up to 45 minutes each day by using the word processor designed for office and professional users.

Consider this: XyWrite II Plus costs about half as much as some of the most popular word processing packages – it's more than twice as fast – has over 150 features and functions, including three types of split screens with simultaneous multi-file access, column moves, boilerplate editing, see-what-you-print display, foreign languages, mail merge...And what's more, we have the best user support team available. They're standing by, ready to help.

Only $295.

With the time you save, XyWrite II Plus will pay for itself in three months.

Mastercard and Visa accepted.

For a demo disk send $7.00. This will be credited if you buy XyWrite II Plus.

Requires the IBM PC, XTor compatible hardware with 192K memory.

XyQuest

P.O. Box 372, Bedford, MA 01730
(617) 275-4439

Please send me _____ copies of XyWrite II Plus
_____ copies of XyWrite II Plus demo disk.

Price includes shipping. (Add 5% sales tax in Mass.)

Check enclosed ____ MC ____ VISA ____

Card No. _____

Exp. Date _____

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Signed _____ PC1113

Compuclassics

SOFTWARE

ALPHA SOFTWARE
ELECTRIC DESK $199
DATA BASE MANAGER II 175

ASHTON TATE
D BASE II 289
D BASE III 375
FRAMEWORK 375
FRIDAY 169

BORLAND
SIDEKICK 35
TURBO PASCAL 35

CONTINENTAL SOFTWARE
HOME ACCOUNTANT PLUS 82
PROPERTY MANAGEMENT 295

DIGITAL RESEARCH
C BASIC COMPILER 360
PASCAL MT+ 360
C 209

FOX & GELLER
QUICKCODE III 165
OZ 269

LEADING EDGE SOFTWARE
WORDPROCESSOR 85
WORDPROCESSOR/MERGEPRINT . 125
NUTSHELL 275

LIFETREE
DELUXE VOLKSWRITER 169

LIVING VIDEOTEXT
THINK TANK (IBM) 129
THINK TANK (MAC) 78

LOTUS DEVELOPMENT CO.
1-2-3 (Version 1A) 309
SYMPHONY 435
1-2-3 UPDATE TO SYMPHONY .. 139

MICRO DATA BASE SYSTEMS
KNOWLEDGEMAN 285
K. GRAPH 130
K. PAINT 59

MICROPRO
INFOSTAR + ... 279
WORDSTAR 199
WORDSTAR PRO-PAC 299
MAILMERGE 129
CORRECTSTAR 129
PLANSTAR 289

MICRORIM
R BASE 4000 289
CLOUT 129
EXTENDED REPORT WRITER 89

MULTIMATE INT.
MULTIMATE 279

MICROSOFT
MULTIPLAN 125
WORD 239
WORD AND MOUSE 299
BASIC COMPILER 249
PASCAL COMPILER 249
FORTRAN COMPILER 249
BASIC INTERPRETER 249

MICROSTUF
CROSSTALK 105
INFOSCOPE 125

SATELLITE SOFTWARE INTL.
WORD PERFECT $279
PERSONAL WORD PERFECT 99

SORCIM
SUPERCALC II 159
SUPERCALC III 229

SOFTWARE PUBLISHING
PFS REPORT 69
PFS FILE (IBM) 85
PFS FILE (APPLE) 69
PFS GRAPH (IBM) 85
PFS GRAPH (APPLE) 69
PFS WRITE (IBM) 85
PFS WRITE (APPLE) 69
PFS ACCESS 60

WOOLF SOFTWARE
MOVE-IT 85

HARDWARE

AST RESEARCH
MEGAPLUS 64K 259
SIX PAC PLUS 64K 259

BIZCOMP
INTELLIMODEM 325
EXTERNAL MODEM 369

HAYES
SMARTMODEM 300 205
SMARTMODEM 1200B (with SMARTCOM II) 419
SMARTMODEM 1200 485

HERCULES GRAPHICS CARD 349

C. ITOH
PROWRITER 8510 339
PROWRITER 1550 629
STARWRITER 40CPS 1100

INTERMATRIX
MACPHONE 155

OKIDATA
MICROLINE 82A 329
MICROLINE 92 453
MICROLINE 93 695

INCREDIBLE PRICES WITH PROFESSIONAL SUPPORT!

- Corporate Accounts Welcome
- We Accept VISA & MasterCharge
- No Credit Charge Surcharge
- Free Technical Support

HOURS
Order Desk & Technical Support Open
8 a.m. to 6 p.m. Monday thru Friday
10 a.m. to 2 p.m. Saturday

SHIPPING
$4 per item UPS surface ($8 for Blue Label); printers $25

TO ORDER CALL
1-800-328-4473 or (818) 705-1895 (CA.)
6934 CANBY STREET (SUITE 104) RESEDA, CA 91335
TLX 292415 KET UR

TERMS
ALL prices subject to change. We honor Cashiers Check/MO/Bank transfers immediately. Allow time for company & personal checks to clear. California residents add sales tax.

CIRCLE 205 ON READER SERVICE CARD

FREE PRODUCT INFORMATION AND UNBELIEVABLE SAVINGS TO

The Independent Guide to IBM Personal Computers

Void after February 28, 1985

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125
126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275
276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325
326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425
426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475
476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525
526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575
576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600
601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625
626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	659	650
651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675
676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725
726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775
776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825
826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850
851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875
876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

PLEASE PRINT CLEARLY—Use only one card per person.

NAME _____ PHONE NO. (_____)_____

COMPANY_____ TITLE_____

ADDRESS_____ APT._____

CITY_____ STATE_____ ZIP_____

(Zip code must be included to insure delivery) PC11/13-2

4 ☐ **Please send me 1 year (26 issues) of *PC Magazine* for $29.97 and bill me. (Full 1 year subscription price of $34.97.)**

Void after February 28, 1985

101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125
126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275
276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325
326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425
426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475
476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525
526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575
576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600
601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625
626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	659	650
651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675
676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725
726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775
776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825
826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850
851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875
876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

PLEASE PRINT CLEARLY—Use only one card per person.

NAME _____ PHONE NO. (_____)_____

COMPANY_____ TITLE_____

ADDRESS_____ APT._____

CITY_____ STATE_____ ZIP_____

(Zip code must be included to insure delivery) PC11/13-1

4 ☐ **Please send me 1 year (26 issues) of *PC Magazine* for $29.97 and bill me. (Full 1 year subscription price of $34.97.)**

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE

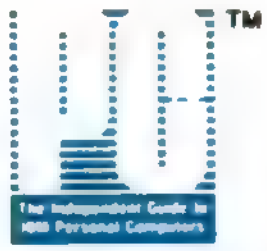
P.O. BOX 13848
PHILADELPHIA, PA 19101

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 27346 PHILADELPHIA, PA

POSTAGE WILL BE PAID BY ADDRESSEE



P.O. BOX 13848
PHILADELPHIA, PA 19101

PC Product Index

DISK OPERATING SYSTEMS

RS#	PRODUCT	ADVERTISER	PAGE#
202	The Bernoulli Box	IOmega	70
220	K.L. Hard Disk Systms	Kamerman Labs	264
391	Coherent	Mark Williams	96

ACCOUNTING SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
238	Rags to Riches	Chang Laboratories	236
260	Business Software	H & E Computronics	412
144	Bottom Line Five	ILAR Systems Inc.	404
199	Accounting Software	Info Designs, Inc.	99
*	Multiplan	Microsoft	106-107
497	Software Series	Spectrum Software	73

INTEGRATED ACCOUNTING PACKAGES

RS#	PRODUCT	ADVERTISER	PAGE#
173	Get Organized	Electronic Arts	180-181
263	Integrated Accounting Packages	Macola Inc.	350
467	Unison	O'Hanlon Computer Systems	289

COMMUNICATION TOOLS

RS#	PRODUCT	ADVERTISER	PAGE#
136	PCOX	CXI	2-3

COMMUNICATIONS SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
129	Communication Edge	Human Edge Software	216
182	The Odd Couple	Command Technology Corp	299
326	Crosstalk	Micro Stuf Inc	318
122	Liaison	Softech Microsystems	1
533	Complete	Transend Corp	203
240	Easy Link (IMM)	Western Union Corp	210
136	PCOX	CXI	2-3

TERMINAL EMULATORS

RS#	PRODUCT	ADVERTISER	PAGE#
136	PCOX	CXI	2-3
128	VTERM	Coefficient Systems Corp	148
166	E M 100	Diversified Computer Systems	350
365	Smarterm/PC	Persoft	300
522	Softerm PC	Softronics	316
185	DataTalker	Winterhalter, Inc	63

OTHER UTILITIES

RS#	PRODUCT	ADVERTISER	PAGE#
112	Copy II PC	Central Point Software	89
359	Batch Tools	Morning Star Systems Inc.	411
514	Print Works	Softstyle	301
130	Apple Turnover	Vertex Systems	357

FINANCIAL PLANNING SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
118	Home Banking Software	Bank of America	59
306	Sideways	Funk Software	94
309	Lumen Software	Prentice-Hall	97
497	Personal Finance Master	Spectrum Software	73
402	Forecast Plus	Walonick Assoc.	298

GRAPHICS SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
154-155	Chartmaster/Signmaster	Decision Resources	8-9
134	Energraphics	Enertronics Research Inc.	56
206	PC Paint Brush	2 Soft	281

INFORMATION MANAGERS

RS#	PRODUCT	ADVERTISER	PAGE#
212	Spotlight	Software Arts	179
415	Desk Organizer	Warner Software, Inc.	306-307
181	File Connection	Flagstaff Engineering	332

PROJECT MANAGERS

RS#	PRODUCT	ADVERTISER	PAGE#
102	Pak Micro	AGS Management Systems	283
453	Promac	Primavera Systems	313

CALENDAR/SCHEDULE ORGANIZERS

RS#	PRODUCT	ADVERTISER	PAGE#
*	Project	Microsoft	164

OTHER INFORMATION MANAGERS

RS#	PRODUCT	ADVERTISER	PAGE#
129	Management Edge	Human Edge Software	216

SOFTWARE FOR PROFESSIONALS

RS#	PRODUCT	ADVERTISER	PAGE#
*	Sidekick	Borland International	18-19
120	Northeastern Software	Northeastern Software	324
213	Service Selection Saving	Software City	91
195	Lease vs. Purchase Analyzer	Software Services of Tampa	326
170	Telesoft	Telasoft	164
493	"It's My Business"	Quest Research, Inc.	29

ENGINEERS/SCIENTISTS

RS#	PRODUCT	ADVERTISER	PAGE#
331	8087 Chip	Microware or Microway	41
530	Engineering Software	Physical Sciences	336

OTHER PROFESSIONS

RS#	PRODUCT	ADVERTISER	PAGE#
129	Sales Edge Negotiation Edge	Human Edge Software	216

STATISTICAL SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
222	P.C. Statistician	Human Systems Dynamics	390
193	Statpro	Wadsworth Professional Software	331

WORD PROCESSING SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
181	Word Connection	Flagstaff Engineering	332
357	Office Writer	Office Solutions	23
374	The Boss	Professional Software Inc	68
189	Readiwriter	Readiware Systems	357
149	Word Perfect	Satellite Software Int'l (SSI)	10
*	XY Write	XY Quest	391

MULTIFUNCTION SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
221	Framework	Ashton Tate	158
161	DunsPlus	DunsPlus	208
207	IBM Software	IBM Corp.	271-273
432	ITSoftware	Martin Marietta/ITSoftware	163
167	Command Assistant	Micro Design Int'l/Command Asst	237
191	Enable	Software Group, The	314-315
461	SysteMate	SysteMate	45
190	MS-DOS Software	Unipress Software	90

EDUCATIONAL SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
138	Educational Video	Ven Compass	78

ENTERTAINMENT SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
540	Art Pak	Pal Software	270

TRAINING SOFTWARE

RS#	PRODUCT	ADVERTISER	PAGE#
111	CDEX Training Program	CDEX Corp.	344

LANGUAGES

RS#	PRODUCT	ADVERTISER	PAGE#
*	Fortran	Microsoft	67

PC PRODUCT INDEX

RS#	PRODUCT	ADVERTISER	PAGE#
COMPILERS			
*	Turbo Pascal Compile	Borland International	21
*	Basic Compiler	Microsoft	69
INTERPRETERS			
*	RM/Cobol	Cybernetics Inc	200
DATA BASE MANAGERS			
217	Carry On System	Carry On Systems Corp.	383
123	CIP	Concentric Data Systems	112-113
218	Revalation	Cosmos, Inc	265
198	PC/Focus	Information Builders	275
325	Knowledge Man	MDBS	154-155
184	Clout	Microrim	172-173
*	Database Manager	Potomac Pacific Engineering	350
209	Powerbase	Powerbase Systems	302-303
493	"It's My Business"	Quest Research Inc.	29
INTERPRETERS			
150	Productivity Tools	Blaise Computing	322
443	Program Developer	RTCS Corporation	299
431	Pocket APL	STSC	242
OTHER LANGUAGES			
192	Sort/Merge Tools	Computer Control	351
TEXT EDITORS			
107	Edit Tool	Amersoft	404
182	SPF/PC	Command Technology Corp	299
OTHER UTILITIES			
219	Data System	Davong Systems Inc	14
164	Personal Copier	Disk Tech	350
204	No Limit Fortran	MFF Environmental	337
340	Disc Mechanic	MLI Microsystems	340
208	U T. Disk	MMTC Ltd	406
346	Power Utilities	Norton Utilities, The	332
268	Hard Runner	Nostradamus, Inc.	98
119	Niceprint	Spies Labs	380
HARDWARE			
161	DunsPlus	DunsPlus	208
231	IBM PC/Family	IBM Corp	271-273
243	51510 Banner	Keytronics	290
IBM PC COMPATIBLE COMPUTERS			
*	AT&T PC Compatible	AT&T Information Systems	195-197
*	Compaq Computer	Compaq Computer Corporation	11
349	PC Model 4	NCR Corporation	24-25
177	Senior Partner	Panasonic Industrial Co.	72
370	IBM PC Compatible	Seequa	55
223	Televideo Systems	Televideo Systems Inc	274

CALL TOLL FREE 1-800-528-1054

COMPUTER WAREHOUSE

PRINTERS

Brother
DX-15 ..... $369
HR-25 ..... $619
HR-35 ..... $875

C. Itoh
8510 Parallel (Prowriter) $315
8510 BPI $335
F-10 Parallel $909
55 CPS Parallel $1189

Comrex
CR II Parallel $339
CR III ..... Call

Computers International
Daisywriter 2000 W/48K $985

Diablo
620 API $699
630 API $1609
630 ECS/IBM $1879

Epson
All Printer Models ..... Call

Inforunner
Riteman $249

Juki
5500 ..... Call
6100 ..... Call
6500 ..... Call

NEC
2050 ..... $569
3550 ..... $1359
7730 ..... $1649

Okidata All Printer Models ..... Call

PRINTERS

Panasonic
1091 ..... Call
1092 ..... Call
1093 ..... Call

Qume
Letter Pro 20 Parallel $619
11/40 W/IBM Interface $1369
11/55 W/IBM Interface $1869

Silver Reed
EXP400 Parallel $289
EXP500 Parallel $355
EXP550 Parallel $419
EXP770 Parallel $849

Star Micronics
All Printer Models ..... Call

Tally
Spirt 80 ..... $255
160L W/Tractor $555
180L W/Tractors $769

Toshiba
P1340 Parallel $719
P1351 Parallel $1249

SPECIAL OF THE MONTH
TECMAR
10 Megabyte in Mini Cabinet $1775

MONITORS

Amdek
310 Amber $145

Princeton Graphic
HX-12 ..... $479

DISKETTES

Elephant
5¼ DS/DD (Qty 100) $218

Maxell
MD-2(Qty 100) $225

Scotch
5¼ DS/DD (Qty 100) $245

MODEMS

Hayes
1200B $409

COMPUTERS

Eagle
All Eagle Models ..... Call

Sanyo
MBC-550 ..... Call
MBC-555 ..... Call
MBC-550-2 ..... Call
MBC-555-2 ..... Call

Zenith
All Z-150 & Z-160 Models ..... Call

TECMAR
Graphics Master $449
128K Dynamic Memory $225
256K Dynamic Memory $299
Captain 128K $299
Captain 256K $399

COMPUTER WAREHOUSE

2222 E. Indian School Rd. • Phoenix, Arizona 85016
Order Line: 1-800-528-1054
Order Processing & Other Information: 602-954-6109

Store Hours: Mon-Fri 10-5:30 Saturday 9-1 Order Line Hours: Mon-Fri 10-5:30 Saturday 9-1

Prices reflect 3% to 5% cash discount. Product shipped in factory cartons with manufacturer's warranty. Please add $8.00 per order for UPS shipping. Prices & availability subject to change without notice. Send cashier's check or money order.. all other checks will delay shipping two weeks. 8/84

CIRCLE 135 ON READER SERVICE CARD

PC PRODUCT INDEX

RS#	PRODUCT	ADVERTISER	PAGE#
ACCESSORY CARDS			
147	Supervision	California Computer Systems	297
MULTIFUNCTION BOARD			
101	Sixpakplus	AST Research	114-115
334	Multifunction Boards	IDE Associates	36-37
437	Sandstar Cards\Modules	Maynard Electronics	38
516	Baby Blue II	Microlog	193
*	Multifunction Board	Paradise Systems	110-111
333	AST Boards	Qubie Distributing Inc.	204
430	Super Rio	STB Systems	C-3
501	Multifunction Board	Tecmar Inc.	C-2
147	Supervision	California Computer Systems	297
VIDEO/GRAPHICS BOARD			
103	Monograph Plus	AST Research	292
146	Hercules Graphic CD	Hercules Computer Technology	61
145	Hercules Color Card	Hercules Computer Technology	5
372	Graphics Board	Mylex Corp	217
502	Graphics Master	Tecmar Inc.	C-4
147	Supervision	California Computer Systems	297
OTHER ACCESSORY CARDS			
147	Supervision	California Computer Systems	297
169	Disc Drive	Micro Design International Inc	405
147	Supervision	California Computer System	297
EXPANSION UNITS			
116	Multi-PC	Anex Technology	269
168	Memory Expansion Kts.	Jameco Electronics	291
INPUT HARDWARE			
172	Speed Key	Koala Technologies Corp.	157
INTERFACE DEVICES			
*	Curtis Elect. Surg. PR	Curtis Manufacturing	222-223
211	PC Datagraph	Seiko	333
147	Supervision	California Computer Systems	297
MASS STORAGE HARDWARE			
106	PC Backup	Alloy Computer Products	328
110	Disk Subsystems	AMPEX	230-231
229	Disc Subsystems	CIA	92
163	Floppy Disk Drives	Disk Drives West	406
227	Storage Subsystems	Everex Systems, Inc.	43
224	Intek Disk. & Memory	Intek	326
186/187	Disk Drives	Interface	16
160	Mercury MegaBank 10	Mercury Mega Bank Corp.	248
165	Hard Disk Drive	Microdesign	156
396	Beta Plus	RP Marketing Corp.	86
196	Disk Drives	Software Support	334
*	Disk Drive & Tape Backup	Sysgen Inc.	80
178	Dynaframe	Vista Computers (Adv. Comp. Prod.)	506
502	Tecmar Hard Disk Drives	Tecmar, Inc.	C-4
MODEM			
109	Ameritec Modem	Ameritec	166
126	A.J. Connection	Anderson Jacobson	88
188	General Data Communications Modem	General Data Communications Industries	152-153
498	Password Modem	U.S. Robotics Inc.	287
NETWORKING			
104	AST PC Net II	AST Research	87
124	OmniNet	Corvus Software	142
471	PC Net	Orchid Technology	28
185	The Data Talker	Winterhalter Inc.	63
OTHER COMMUNICATIONS HARDWARE			
455	Irmakey	Digital Communications Assoc	30-31
DISPLAYS/MONITORS			
299	PGS Monitor	Princeton Graphic Systems	32
203	Amber Chrome Monitor	Quadram Corp.	27
383	Qubie Hard Dsk Drive	Qubie Distributing Inc.	165
201	Quimax Monitor	Quimax Systems Inc.	317
PRINTERS			
114	Anadex Printer	Anadex	22
153	Data Products	Dataproducts	198-199
444	IrmaPrint	Digital Communications Assoc	12-13
151	Epson Printers	Elek-Tek	385
*	Printer	Texas Instruments	279
DOT MATRIX			
114	Rapid/Scribe	Anadex	22
113	Citizen Amer. Printer	Citizen America Printer	174-175
342	Pinwriter	NEC Information Systems	53
462	3-In-One	Toshiba	239
PRINTER DRIVERS			
316	Printer Boss	Connecticut Software	301
VOICE SYNTHESIZERS/SOUND RELATED HARDWARE			
[illegible]	SynPhonix	Artic Technologies	291
DISKETTES			
505	3M Diskettes	3M Data Recording Products Div.	304-305
139	Flexidisks	BASF	238
137	Elephant Memory Disk	Dennison Computer Supplies	209
143	Nashua	Disk World!	330
*	Diskettes	Diskette Connection, The	351
194	Verbatim Diskettes	Lyben Computer Systems	340
ACCESSORIES			
175	Disk Back-Up	Ellicot Software	351
*	Accessories	Micro Computer Accessories	44
141	Data Saver	Cuesta Systems Inc.	405
225	PC Support	Inmac	357
SUPPLIES			
105	Periferal From Acton	Acton	170
121	Dust Covers	Contemporary Computerwear	340
275	Master Piece	Kensington Microware Ltd.	108
454	Wire Tree	Networx	183
215	Emergency Power System	Tripp Lite	301
LITERATURE			
125	Books	CBS Educational & Professional	171
176	Periodicals	Data Sources	323
[illegible]	Harper & Row Books	Harper & Row	104
ORGANIZATIONS AND SERVICES			
226	Computer Information Network	Compuserve Information Service	243
140	D.D. Information Services	Data Decisions	71
180	Investor's Express	Fidelity Investors	340
162	Service for the PC	IBM-ISG Division	295
216	The Micro Exchange	Micro Exchange, The	26
*	Computer Insurance	Safeware	385

The publisher does not assume any liability for errors or omissions in the product index.

FIND OUT WHA

Do your own research.

Call your favorite computer products supplier. Or thumb through the rest of this magazine. Price the quantities of the items you really want.

Then call us.

What's in store for you is the largest selection of computer products around. At the most competitive prices you'll find anywhere.

Networking/ Protocol Conversion

We're at the cutting edge of Corporate Networking and Protocol Conversion products. We're experts in Emulation Boards. Call for our unadvertised special manufacturers and products.

SNA & BISYNC 3780, 5251, 3274, 3278

PC TURBO 186 by ORCHID, 80186 coprocessor board, speeds up your PC 5 times.

IRMA / IRMALINE Replaces 3278's with PC's.

IRMAGRAPH Upgrades *IRMA* to 3279 graphics capability.

IRMAPRINT Enhances *IRMA* graphics.

PCnet by ORCHID, we carry the complete line.

BLUE LYNX *5251 Mod 12 & 3276* Emulators by TECHLAND.

Printers & Plotters

Micro Mart has thousands of printers in stock.

AMDEK *AMPLOT II*, 6 pen plotter, supports Lotus.

HOUSTON INSTRUMENTS Plotters and digitizers.

Dot Matrix

SMITH CORONA *D-300*, manufactured by TEC, 140 cps.

EPSON *FX80 & 100*, 160cps.

EPSON *RX80 & 100*, 100 cps.

EPSON *LQ 1500*, letter quality in a dot matrix.

OKIDATA *92 & 93*, optional IBM PROMS, 160 cps.

OKIDATA *ML84*, 200 cps, optional IBM PROMS.

OKIDATA *Pacemark 2410*, 350 cps.

TOSHIBA *P-1351 & 1340*, superb letter quality and graphics.

DATAPRODUCTS *PRISM 8050 Color*, IBM's choice for less. 132 column, superb graphics, 200 cps.

STAR MICRONICS We carry the entire Star line of *Gemini*, *Delta* and *Radix* printers.

TEXAS INSTRUMENTS *The 855*, w/replaceable font cartridges.

NEC *Pinwriters, P2 & P3*, 180 cps.

Letter Quality

NEC *Spinwriters 2050, 3550* & the new *8850*.

DIABLO *620, 630 & 630 ECS*.

C-ITOH *Starwriter*, 40 cps; *Printmaster*, 55 cps.

QUME *Sprint 11/40 Plus, Sprint 11/55 Plus*.

Micro Mart has a full range of Form Handling options and Peripheral Devices. Call us for any printer accessory need.

Floppy Disk Drives

TANDON *TM 100-2*, Dbl. sided, dbl. density, 360K, The IBM Drive.

1/2 HEIGHT DISK DRIVES From SHUGART, PANASONIC, TEAC. We have the south's largest supply of top names.

Chips

We've stock-piled the best for you. Call us for quantity prices.

INTEL 8087 High speed math coprocessor.

64K RAMCHIPS For the IBM-PC compatibles and their boards.

Hard Discs

We carry all major name brands so if you don't see it—ask for it, and we'll give you our best price.

PEACHTREE PERIPHERALS *The P-10, 20 & 50*, auto boot, internal & external installation.

SYSGEN *10 & 20* Meg w/streamer tape for faster streaming & formatting.

SYSGEN *Image*, streamer tape back-up for your IBM XT.

BERNOULLI TECHNOLOGY Hard Disc Subsystems.

Multifunction Boards

We sell more of these than anyone else, so we've become experts on boards of all types.

ULTRA PAK 64-384K, mono & color graphics, multifunc. board.

SIX PAK 64-384K, multifunc.

MEGAPLUS 64-512K, maximum 8 function.

I/O PLUS Ser., Clk., Splr., Ramdisk, opt. 2nd Ser., Par., & Game.

QUADRAM *QUADBOARD*, New Version, 64-384K, multifunc.

TECMAR *CAPTAIN*, 64-384K, multifunc.

TALLTREE *J-RAM II*, 0-512K, multi-func., w/J-RAM Software.

PROFIT SYSTEMS 64-512K, *RAM Plus & Elite* with Tascmaster software.

MICROLOG *BABY BLUE II*, 64-256K, Z80 coproc., extra software.

ORCHID *PC Blossom*, 64-384K multifunction with optional *PCnet* Piggy-Back.

MAYNARD *Sandstar*, mod. Floppy & Hard Disc Controllers.

Graphic Cards

PERSYST *BoB board*, Best of Both, doubles text resolution & color graphics.

STB *Graphics Plus II*, color & mono, w/parallel port & software.

HERCULES Mono & color graphics cards support Lotus on IBM.

PLANTRONICS *ColorPlus +*, HiRes color board, parallel port, with Color Magic or Draftsman.

TECMAR *Graphics Master*, HiRes color & mono supports Lotus.

QUADRAM *QUADCOLOR I & II*, up-gradable color cards for IBM.

PROFIT SYSTEMS *Multigraph*, 132 column monochrome 720h x 350v, color graphics 640h x 400v.

PARADISE SYSTEM *Multi-display* or *Modular Graphics Cards*, color & mono, parallel port.

Software

Accounting

SORCIM / IUS A/P, A/R, G/L, inventory, order entry, payroll.

PEACHTREE A/P, A/R, G/L, payroll, job cost, inventory, order entry.

Spreadsheets & Integrated Packages

ASHTON-TATE *Framework*.

LOTUS *Symphony and Lotus:* spreadsheet, word processing & data base.

MICROSOFT *MultiPlan*, comes with choice of templates.

MDBS *Knowledge Man*, spreadsheet, data base & graphics.

PEACHTREE *Decision Manager*, micro to mainframe integrated package.

SORCIM *SuperCalc 3*, Version 2.0, superior graphics to Lotus.

SPI *Open Access:* spreadsheet, 3-D graphics, word processor, time manager & communications in one package.

Enhancements & Utilities

FOX & GELLER Complete line of enhancement products for *dBase II, III & Rbase 4000*.

NORTON Complete line of utility programs for IBM-PC.

Micro Mart is a registered trademark of Micro Mart, Inc., IBM is a registered trademark of International Business Machines Corporation.

Atlanta, New Orleans, Charlotte, Louisville, Nashville, Raleigh, Ft.

T'S IN STORE.

ROSESOFT *ProKey 3.0*
CENTRAL POINT SOFTWARE *Copy II PC*
ATI *Training*, critic's choice software tutorials.
SOFTSTYLE *Set FX*, Epson font control package.
SIDEWAYS Inverts printout.
BORLAND *Sidekick*.

Compilers & Language Tools

LATTICE *C*-Compilers, most popular 1 Meg RAM on PC.
MICROSOFT Complete line of compilers.
DIGITAL RESEARCH Complete line of compilers.
BORLAND *Turbo Pascal, Turbo Toolbox* and more.

Graphics & CAD

Zsoft *PC Paint Brush*, mouse driven graphics w/screen dump util.
DECISION RESOURCES *Chart-Master/Sign-Master* graphics pkgs. for printers & plotters.
AUTODESK *AutoCAD*, the most popular graphics package in the world.
ENERTRONICS *Energraphics*, low cost graphics & CAD package.
MICROPRO *ChartStar*.

Communications

MICROSTUF *CROSSTALK XVI*, communications.
HAYES *SMARTCOM II*, communications.
VM *Relay*, communications.

Word Processors

MULTIMATE Latest version with spelling checker and tutorial.
SAMNA *III*, New Flagship word processor.
MICROSOFT *Word;* 4th generation word processor, w/or without mouse.
LIFETREE *VOLKSWRITER DELUXE*
MICROPRO *WordStar Professional* series with Tutor, CorrectStar, MailMerge & Star Index.
SSI *WordPerfect;* popular word processor emulates IBM's Displaywriter.
PEACHTREE *PeachText 5000*, Personal Productivity Series.

Office & Project Planning

HARVARD *Harvard Project Manager*.
IUS *Easy SalesPro*.
MICROSOFT *Project*.

Data Base Managers

MICRORIM *4000* or *6000*, Report Writer & Clout options.
GMS SYSTEMS *Power-base*, relational and hierarchical data base.
ASHTON-TATE *dBase II & III*.
MICROSTUF *Infoscope*, critically acclaimed data base.

Modems

HAYES *Smartmodem 300, 1200, & 1200B*.
NOVATION Complete line of internal & external.
RIXON 1200-4800 BAUD synchronous & asynchronous models.
ANCHOR AUTOMATION *Signalman Mark XII*, 300-1200 direct connect.
VEN-TEL The 1200 BAUD & Half Card for the IBM portable & XT.

Miscellaneous Hardware & Accessories

DYSAN The #1 Quality Diskette in the World. Quantity savings.
MICRO MART DISKETTES Our own brand is dbl. sided/dbl. density and carries a 7 year warranty.
KEYTRONICS *5150 & 5151* keyboards for the IBM-PC.
LQ SHEET FEEDERS Cut sheet feeders for the NEC 3550 & C-ITOH printers.
MOUSE SYSTEMS *PC Mouse*, optical type, 3 button with software.
MICROSOFT *Mouse;* Bus or serial mechanical mouse with mouse menu software.
CURTIS Monitor pedestal, keyboard extension cable, monitor extension cable.
QUADRAM *MICROFAZER*, print buffer: 8-128K.
TRIPPELITE Back up power supply 200-1000 Watts, and *ISOBAR* surge protectors with 4 & 8 plug.

Monitors & CRT's

PGS *MAX 12*, amber, runs off the IBM Mono Card, 720 h x 350v.
PGS *SR-12*, 690h x 480v, HiRes RGB with dual scan card.
PGS *HX-12*, HiRes 690 Dot RGB.
QUADRAM *QUADCHROME*, HiRes 690 Dot RGB.
AMDEK *COLOR I, IIA & IVT*, The industry standard RGB's.
AMDEK *COLOR 300, 500, 600, 700, 710*, new complete line of HiRes RGB's.
AMDEK *300A/300G*, Industry std. composite monitors.
AMDEK *310A*, amber 12," improved alternate IBM Green Screen.
WYSE Terminals, 100, 75, 50, entire line in stock.

Size, Service & Support.

When you're calling around for prices, remember the kind of service and support our 40,000 square foot Service and Distribution Center can give you. Plus we have over one hundred people whose job it is to serve you.

Our service and support are so good, we ought to be able to charge retail prices. But we don't.

Call us for expert advice and your best price.

©1984 Micro Mart, Inc.
Technology Corporate Campus
3189 Campus Drive
Norcross, GA 30071

America's PC Specialist.

MICRO MART

ORDERS ONLY
1-800-241-8149
FOR INFORMATION
1-404-449-8089
TELEX 880497

Lauderdale, Orlando, Tampa, Miami, Tyson's Corner, Rockville.

CIRCLE 159 ON READER SERVICE CARD

A Communications Software Primer

When it comes to choosing a communications program, you have to consider hosts, smart and dumb terminals, error-checking protocols, and communications cruise control.

Choosing communications software can be as simple as using the program that comes with your modem or getting a copy of *PC-TALK-III* from a friend. On the other hand, it can be one of the most bewildering software choices you'll ever make.

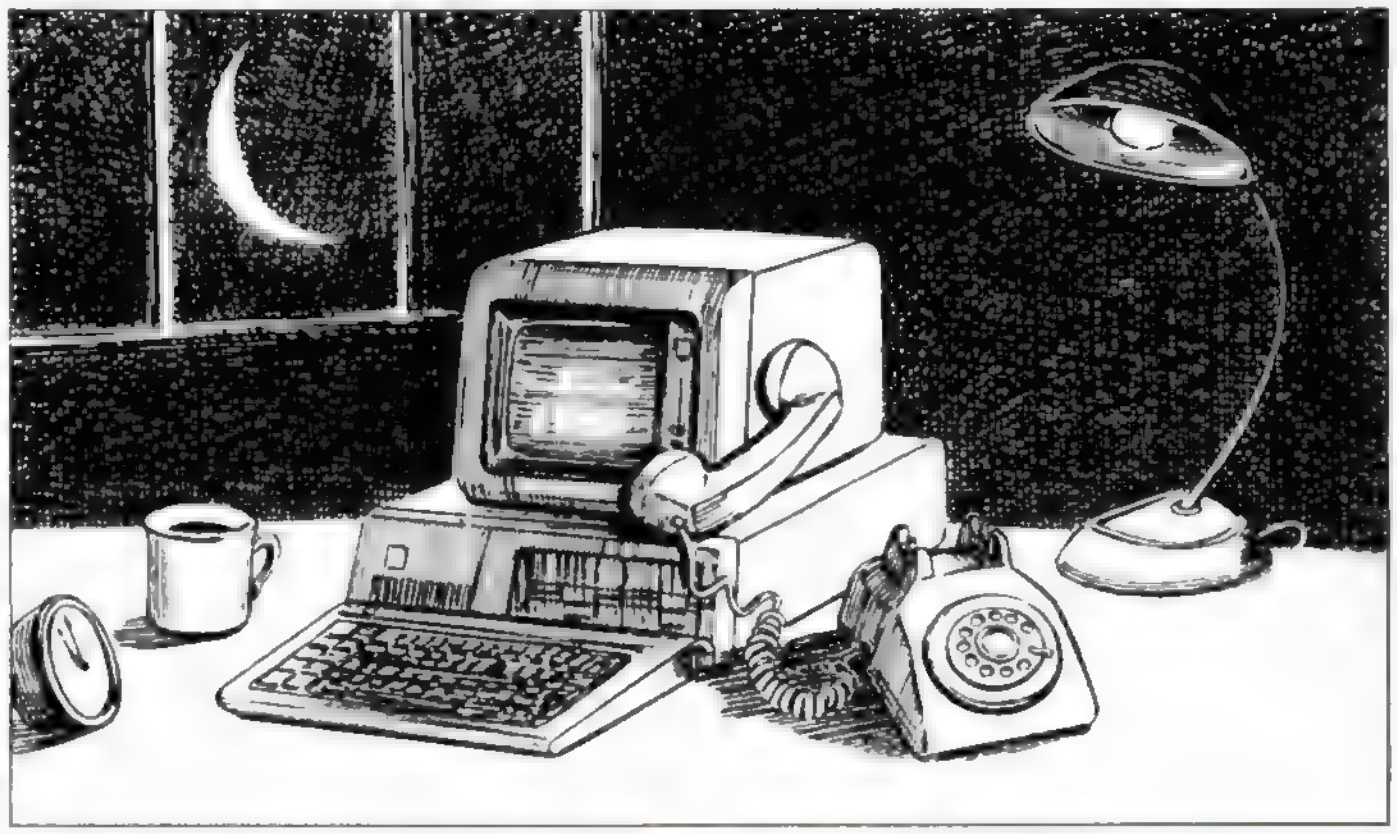


Illustration: Kimberly Root

The First of Many Distinctions

The first step in understanding communications software is to consider the distinction between host computer and terminal—a distinction that goes back to pre-PC times. The host computer, which can be anything from a micro to a mainframe, is connected to the terminal. When you call CompuServe, for instance, the CompuServe computer is the host and your PC becomes the terminal.

The distinction between host and terminal can get fuzzy when you're dealing with PCs. If your system is set up so I can call you, and each of us can type things at the keyboard that the other can read, then we are dealing with two terminals. But if your system is set up for unattended, auto-answer, remote operation, it is acting as a host. I can call, run programs, and give your system orders to send me files. The only difference between the two situations is the software you're running. The program that lets your PC act as a terminal is best described as a terminal program.

Drawing the Line

Terminals and terminal programs come in two basic varieties: dumb and smart. Strictly speaking, a dumb-terminal program lets you do nothing more than type at your keyboard and read from your screen. As soon as you add even one feature—automatic dialing, automatic log-on, or the ability to turn a printer on and off—you have a smart-terminal program. A more useful place to draw the line between dumb- and smart-terminal programs, however, is with the smart terminal's ability to capture incoming information and save it to disk.

Smart-terminal programs divide quite nicely into two categories: those that are designed for direct interactive communications, meaning that you have to be at the keyboard operating the computer, and those that are able to operate unattended.

Most smart-terminal programs include a file-transfer capability. Without this capability, a smart terminal forces you to transfer files in a clumsy, two-step procedure. To send a file, you load it into the PC's memory and then use a second command to transmit it. To receive a file, you capture the incoming information in memory and then save it to disk. The file-transfer function lets you use a single command to transfer files directly to or from the disk.

(continued)

Virtually all programs that have a file-transfer capability will let you transfer both ASCII files (text files) and binary files (usually program files). Normally you designate the kind of file transfer you want at the time of the transfer. Be aware, however, that transferring a binary file can be like playing Russian roulette. Telephone lines are noisy, and noise translates into errors. An occasional error in a text file is no big deal—it can be spotted easily and corrected. However, an error in a program file is difficult to find, and it can render the program useless.

Error Hounds

The solution is to use an error-checking protocol. Several protocols are available, and each works differently, but the basic idea is the same: The receiving computer sends information back to the transmitting computer for comparison and confirmation. If the information isn't what it's supposed to be, the transmitting computer tries sending that part of the file again.

Most error-checking protocols are proprietary and can be found bundled with programs sold by a single company. These protocols are useful for transferring files between two or more of your own computers. If you want to exchange files with other people, however, you're probably better off getting a program that uses a more commonly used protocol.

For this purpose, the only reasonable choice at the moment is the XMODEM protocol (also known as the MODEM7 protocol). (See "XMODEM: A Standard Is Born," *PC*, Volume 3 Number 7.) XMODEM is not 100 percent reliable, but because it is in the public domain, you'll find it on a large number of programs. You might also want to look for a program that gives you the choice of two or more protocols. Error-checking protocols should not be confused with other kinds of communications protocols, such as the X/On-X/Off protocol. X/On-X/Off is an important capability in file transfer, but it has nothing to do with error checking.

When you're receiving a file that is larger than your PC's memory capacity, it's important to have a way to tell the other computer to stop and wait while your PC frees up its memory by writing the information to disk. The X/On-X/Off protocol lets you do that. When the receiving PC runs out of memory, it sends the X/Off signal, which the transmitting computer reads as, "Hold on—I'm busy." When the computer is ready for more, it sends the X/On signal, which says "Okay, go ahead." For capturing incoming data to disk, you want a program that has an error-checking protocol *and* the X/On-X/Off protocol.

> If you want to exchange files with other people, get a program that uses a commonly used protocol.

Many terminal programs have other features as well, including automatic dialing and redialing, automatic log on, and the ability to define function keys so you can send long commands to the host system with a single keystroke. For programs designed for direct interactive communications, such capabilities are sophisticated conveniences. For programs designed for unattended operation, however, they're necessary.

Communications Cruise Control

Unattended operation can be divided into two basic categories: incoming and outgoing.

Outgoing unattended operation lets you fully automate your communications session, so you could, for instance, leave your office at 5 p.m. but set your PC to wake up after 6, when rates are lower. It could then dial the phone, log on to a system, ask for information, save that information to disk, log off the system, and hang up.

Incoming unattended operation is often referred to as remote operation—the PC becomes a host computer that will answer the phone and obey orders from the caller. A more prosaic kind of remote operation would let you leave your New York office at 5 p.m. Eastern Time and leave your PC running so that your Los Angeles office could call at 4:30 Pacific Time and send a daily report. You would find the report waiting for you at your office the next morning.

For the Beginner

If you are new to communications and you don't need fancy features like unattended operation, the first program you should get is *PC-TALK-III*. It isn't the best program available, but it is one of the better ones for nonautomated communications. More to the point, it serves as a standard against which you can measure other programs, and the price can't be beat.

PC-TALK-III is distributed as "user-supported" software, which means you can probably get a copy from a friend or a user group. Payment is strictly on the honor system: $35 if you like it, nothing if you don't. You can also get a copy directly from Headlands Press by sending $35 or by sending a formatted double-sided disk or two formatted single-sided disks along with a pre-addressed, prepaid return mailer. The address is Headlands Press, Inc., P.O. Box 862, Tiburon, CA 94620.

Considering that you can try *PC-TALK-III* for free, there's no reason to settle for anything less (or rather, anything more!). At the very least, you can use *PC-TALK-III* as a baseline program, treating it as a bargain-basement minimum. There's a good chance you won't need anything more for your communications needs, and if you do, you'll have some experience upon which to base your decision. ■

PROGRAMMERS: *Why Fool Around?*

EDIT your source and data files with the AmeriSoft EDIT TOOL — the Powerhouse of program editors. Why settle for less — when you can have the best?

Only Edit Tool can:

- Browse/Edit over 10 files at once, with 10 buffers for data transfer.
- Window data horizontally/vertically — up to 99 views into files.
- Build new commands and define function keys with key macros.
- Restore up to 64 edit changes — even large block deletes.
- Offer data security, with automatic backup and power down recovery.

Demand the best. Get mainframe editing power for your PC.

EDIT TOOL

List $225. Demo Disk $10
In CA: List $238.50. Demo Disk $10.60
Add $3 for shipping

CALL TOLL FREE

1-800-358-9092 x627
In CA: 1-800-862-4982 x627

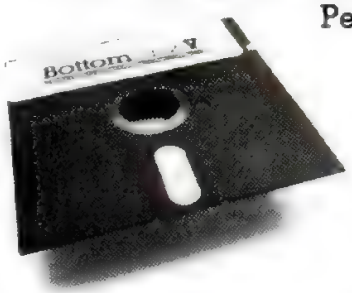
AmeriSoft ™

(707) 778-8594
345 So. McDowell Blvd., Ste. 410
Petaluma, CA 94952

CIRCLE 107 ON READER SERVICE CARD

INSTANT FINANCIAL PICTURE!

Corporate Financial Simulation Model on your IBM PC or XT with Lotus 1-2-3, Multiplan, SuperCalc, VisiCalc or PeachCalc. Also available on most CP/M & all Apple systems. A $6,000 value for $295.



Bottomline V

A Financial Decision Support System — budgeting, planning, analysis, and five-year forecasting.

Fill out this card and mail for complete details, or call (714) 476-2842.

☐ Send more information
☐ Please send me Bottomline V for _____ Spreadsheet on the _____ computer. My check for $295 plus $5 for shipping and handling is enclosed.

Name _____ Title _____
Company _____ Phone _____
Street _____
City _____ State _____ Zip _____

Mail to: **ILAR Systems, Inc.**
Formerly Strategic Software Systems, Inc
1300 Dove Street, Suite 200
Newport Beach, CA 92660

CIRCLE 144 ON READER SERVICE CARD

SHELF CONSCIOUS?

Now you can organize your copies of

PC MAGAZINE

Now your magazines can be a handsome addition to your decor, well organized, and easy to find, thanks to these durable library-quality cases or binders. They're made of luxury-look leatherette over high-quality binder board. And both styles are custom-designed for this or any other magazine you save, with size, color and imprint selected by the publisher. FREE transfer foil included for marking dates and volumes.

Magazine binders
holds your issues on individual snap-in rods, combining them into one volume $7.95 each; 3 for $22.50; 6 for $42.50. Mixed titles OK for quantity prices

Open-back cases
store your issues for individual reference $6.95 each; 3 for $19.75, 6 for $37.50. Mixed titles OK for quantity prices

For faster service,
CALL TOLL-FREE
800-526-0790
(In NJ only 201-540-0445)

PC Magazine
P.O. Box 5120, Philadelphia, PA 19141
Please send: ☐ Cases ☐ Binders

TITLE	QUANTITY
PC Magazine	_____
Other: _____	_____

☐ PAYMENT ENCLOSED $_____* Add $1.00 *per order* for postage and handling. Outside USA add $2.50 *per unit* ordered; send US funds only.
☐ CHARGE (Minimum $10)
☐ American Express ☐ MasterCard
☐ Visa

Card No. _____ Exp. Date _____
Signature _____
Print Name _____
Address _____
City _____
State/Zip _____
*Residents of PA add 6% sales tax

COMING UP

A Member of the Ziff-Davis Family of IBM PC Magazines

Fixed Disk Systems

A comparative review of ten, 10-megabyte, internal fixed disk systems that provide a significant improvement in both capacity and performance over diskette storage. The article includes some practical benchmarks for getting good measurements of fixed disk performance.

Significant Figures

In October, we carried the first of a series of three articles on floating-point routines, which are used to represent fractions or to work with numbers larger than 65,535—the largest number representable in 16 bits. Multiplication and division are the subject of the second part of this series.

Modula-2, Part 1

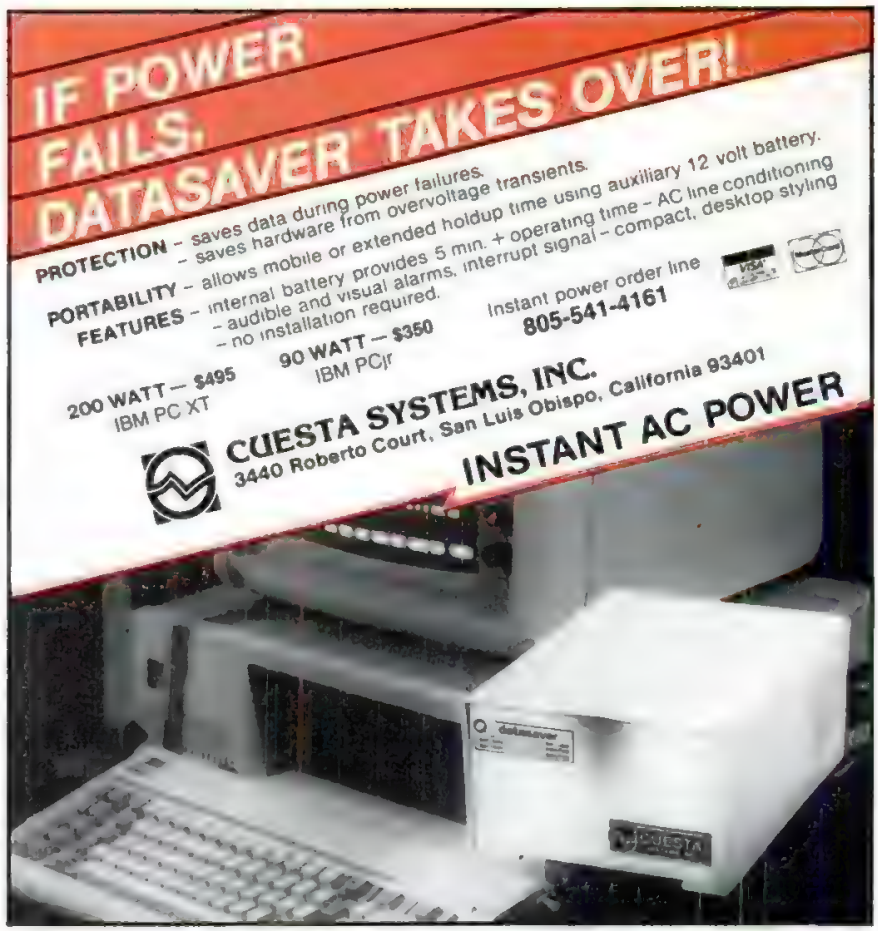
An introduction to the programming language that combines the strong type checking, readability, and run-time error checking of Pascal with the flexibility and low-level access of C. The second part of our Modula-2 coverage will run in December—a comparative review of three compilers.

Communications

Another in our continuing review of communications products for the PC.

Program Overlays

Plink86 is an overlay linker than can make a fat program thin again without requiring the programmer to cut out even one byte of code. A complete review.



CIRCLE 141 ON READER SERVICE CARD

CIRCLE 169 ON READER SERVICE CARD

CIRCLE 296 ON READER SERVICE CARD

GUARANTEED DATA RECOVERY — & MORE! —

Restore deleted PC-DOS files on floppy, Internal and most External Hard Disks or a combination of the three, plus much more.

U.T. Disk (r) is the most sophisticated and versatile disk utility tool available today. Here are some of the features:

- Two ways to restore deleted data.
- Hex & ASCII sector editing.
- Raw sector data searching.
- FAT mapping.
- FAT editing.
- Debe-Type copy & save.
- Volume/Device usage graphics.
- Custom Configurations.
- File & Sub Directory status editing.
- Menu driven / Fast / In color.

For $ 89.00 a data recovery guarantee that has no equal!

Maximum configuration: 4 Floppy drives, 2 internal hard drives plus 3 external hard drives.

Available through your dealer or contact:

MMTC Ltd.
702 Ironwood Drive
Mt. Prospect, Illinois 60056
312-577-7392

CIRCLE 208 ON READER SERVICE CARD

A Library of Software on Diskette for the IBM PC and PCjr

Volume 1, Number 9 On Sale Now

A Member of the Ziff-Davis Family of IBM PC Magazines

The Planner

If trying to remember meetings, luncheons, appointments, and activities makes your head spin, *The Planner* can help you stay organized. With it you can enter, revise, reschedule, find, or display your engagements over any time frame you desire, quickly and easily. The main screen divides the day into half-hour intervals, each with two blank lines for descriptions of your appointments. It also includes a separate daily list where you can record up to eight different activities. Check any day or your entire week at a glance and print hardcopies for later reference. You can also reschedule at the touch of a key or search your schedule for a particular appointment. *The Planner* makes pen and paper scheduling obsolete.

Note Indexer

Question: How do you manage the prodigious amount of information you have access to through your computer? Answer: You index, edit, and cross-reference all of your important notes with *Note Indexer*'s electronic index card file. Enter your textual information into the program's database files and reference it by labels, key words, or card numbers. You can then search for particular notes on a single key word. Perfect for business ideas, sales activities, or reading notes, *Note Indexer* helps you manage any information to which you need quick access.

Sound Tutor

Don't just look at your computer; listen to it too. *Sound Tutor* is a program that will explain how to generate sound with your PC. First listen to the various sample sound effects, then list the code behind each example. Once you understand the four methods used to generate these sound effects—immediate data, generated data, step loops, and DATA statements—you can incorporate such code into your own BASIC programs.

Political Pursuits

You are running for president, and you have only 2 months to turn your party's nomination into victory. Establish yourself as a Republican or Democrat and take a conservative or liberal stand on sensitive political issues such as unemployment, military appropriations, and women's rights. Rally your support with television or newspaper ads, travel throughout the U.S., and attend news conferences or debates. Each week you must choose new campaign strategies, and every Monday you face an opinion poll that compares your popularity with that of your opponent.

HOW TO AVOID THE CHRISTMAS RUSH

Christmas is coming and everyone is hurrying to take advantage of the end of the year bargains. As the malls fill to overload capacities and traffic jams are as common as mistletoe, your local computer store will become even more of a zoo. Why not have a cool Christmas and shop with the experts at PROGRESSIVE. Choose from literally hundreds of the newest and finest product lines available, and at prices that would put a smile on Santa's face. A call is all it takes to have your sleigh full of PC goodies delivered to your door, quicker than Donner and Blitzen. Let the experts at PROGRESSIVE take the rush out of Christmas. **CALL US NOW AT 1-800-446-7995 and we'll show you why we're called PROGRESSIVE.**

☑ PRICE ☑ STOCK ☑ SERVICE ☑ SUPPORT

Disk Drives For Less:

TANDON TM 100-2 ...$179

HEY XT OWNERS!!! Add a B drive with our **HALF HEIGHT SPECIAL!!!** Two half height drives, cable, brackets, 1 year warranty all for just $299

Individual **HALF HEIGHTS** ..... **each $149**

FULLY XT COMPATIBLE 10MB internal half height hard disk

We sell only the highest quality 10MB half heights in the market! Specially designed for the PC's power supply, comes with auto-boot ROM feature, fully warranteed..... $995

Printers:

NEW EPSON PRICES!!!

EPSON FX-80 (160cps, 10") $425
EPSON FX-100 (160cps, 15") $625
EPSON RX-80 (100cps, 10") $245
EPSON RX-80F/T (100cps, 10" w/platten) $295
EPSON RX-100 (100cps, 15" while they last) $425
EPSON LQ-1500 (LQ dot matrix) complete $1295
OKIDATA ML92 (160cps, 10") $439
OKIDATA ML93 (160cps, 15") $659
OKIDATA ML84 (200cps, 15") $795
OKIDATA PACEMARK 2410 (350cps, 15") $1995
OKIDATA PACEMARK 2350 (350cps, 15", no CQ) ..... CALL
GEMINI 10X (120cps, 10") $275
GEMINI 15X (120cps, 15") $395
DATAPRODUCTS 8010 (180cps, dot matrix, 10") ..... CALL
DATAPRODUCTS 8020 (180cps, dot matrix, 15") ..... CALL
DATAPRODUCTS 8050 (200cps, dot matrix, 15") $1395
DATAPRODUCTS 8070 (400cps, dot matrix, LQ15") $1695
TOSHIBA P1340 (LQ dot matrix, 10") $775
TOSHIBA P1351 (LQ dot matrix, 15") $1395
TI-855 (LQ dot matrix w/font cart) $775
DIABLO 630API (40cps LQ) $1595
DIABLO 630ECS (192 chars on wheel) $1999
NEC 2050 (Durable, low cost LQ) $865
NEC 3550 (33cps LQ) $1595
NEC 7730 (55cps LQ) $1995
C.ITOH STARWRITER (40cps LQ) $1025
C.ITOH PRINTMASTER (55cps LQ) $1425
QUME SPRINT 1140 (40cps LQ) $1395
QUME SPRINT 1155 (55cps LQ) $1695
BROTHER HR-25 (20cps LQ, 15") $675
BROTHER HR-15 (17cps LQ, 10") $425

Hard Disk Drives:

PEACHTREE PERIPHERALS 10MB internal $995
EVEREX 10MB internal $995
MAYNARD 10MB internal $895
MAYNARD 30MB internal $2195
SYSGEN 10MB HARD DISK (w/tape back up) $2395
SYSGEN 20MB HARD DISK (w/tape back up) $2895
SYSGEN IMAGE 10 minute XT tape back up $795

CALL FOR TECMAR, DAVONG, AND TALLGRASS PRICES

Multifunction Boards:

EXPANDED QUADBOARD (64K-384K,S,P,G,C/C,bracket) . $269/459
AST 6-PAK (64-384K,S,P,C/C,opt G) $269/459
AST MEGAPLUS (64-512K*,S,C/C,opt S,P,G,K) ..... from $299
AST I/O PLUS (S,C/C,opt S,P,G) ..... from $139
ORCHID BLOSSOM (64-384K S,P,C/C, **opt PC Net**) ..... from $249
TECMAR CAPTAIN (64-384K,S,P,C/C) ..... from $259
BABY BLUE II (64-256K,Z80B,2S,P,C/C) ..... from $429
PERSYST Time Spectrum (64-384K,S,P,c/c, 2 yr. wrty) $279
PROFIT RAM ELITE & PLUS (RAM & I/O) ..... CALL

Display Cards:

EVEREX GRAPHIC EDGE (Simult. color & mono, w/ports $399
TSENG UltraPAK (132 mono,S,P,C/C,opt RAM, FDC, color) .. $439
PARADISE MODULAR GRAPHICS CARD (Color/graphics in mono w/ports!) ..... from $339
PERSYST BoB (finally clear text on a color monitor) ..... CALL
STB GRAPHIX PLUS II (Mono, color, par) $369
PROFIT MULTIGRAPH (Mono, color, opt par) $399
TECMAR GRAPHICS MASTER (640x400 + mono) $485
QUAD COLOR I and II (Color, hi/res opt) $209/CALL
HERCULES COLOR CARD (New from old faithful) $199
AST MonoGraphPlus (LOTUS mono, serial, parallel, clock) ... $399
PLANTRONICS Colorplus (Hi/res w/color magic) $379

Monitors:

AMDEK COLOR 710(No glare no flicker ultra hi/res) $579
AMDEK COLOR 700 (New ultra hi/res RGB) $435
AMDEK COLOR 600 (New hi/res RGB w/audio) $429
AMDEK 300 A and G (Amber or green) ..... $149/$139
AMDEK 310A (Amber, dark non-glare tube) $175
PGS SR-12 (690x480 non-interlaced) $599
PGS HX-12 (690x480 interlaced) $479
PGS MAX-12 (720x350 mono) $189
TAXAN RGBvision (Hi/res color monitors) ..... **BEST PRICE**

Chips (Always in stock):

64K RAM CHIP MEMORY UPGRADE (set of 9) **$39**
full 90 day warranty
WE ARE CHIP BROKERS, ASK FOR QUANTITY PRICES

Networks:

ORCHID PC NET PLUS NODE CARDS ..... **BEST PRICES-CALL**
OTHER BRAND NAMES AVAILABLE... **WE CARRY ONLY THE BEST**

Miscellaneous:

INTEL 8087 COPROCESSOR (High speed math) $169
ISOBAR SURGE PROTECTORS (4 & 8 plug) ..... $49/$69
KEYTRONIC 5151 KEYBOARD (Sep. cursor keys) $199
IRMA by DCA (3278 Terminal Emulation) $895
IRMALINE (Remote Emulation) ..... CALL
MOUSE SYSTEMS (Optical mouse, runs LOTUS) $139
POWER BACK-UP (200 & 425 watts) ..... $269/$499
ORCHID PC TURBO (80186 coprocessor-runs at 8MHz) ..... CALL
MICROFAZER (8-128K print buffer) ..... from $139
BRET SALTER'S new debug board w/software ..... CALL
VERBATIM DS/DD DISKS $29

Modems:

HAYES 300 baud external $299
HAYES 1200 (300 or 1200 baud ext) $499
HAYES 1200B (300 or 1200 baud int w/soft) $399
HAYES Compatibles ..... CALL
SIGNALMAN MARK 12 (1200 baud at 300 price) $259
VENTEL HALF CARD ..... **BEST PRICE**

Software:

SYMPHONY (New from LOTUS) ..... **BEST PRICE-CALL**
FRAMEWORK (New from ASHTON-TATE) $395
MULTIMATE (Emulates WANG dedicated WP) $289
SAMNA ("Ultra-WANG") ..... **BEST PRICE**
WORDSTAR PRO-PAK (New version) $249
MICROSOFT WORD w/MOUSE $289
PFS Write, Report, File and Graph ..... each $99
OPEN ACCESS (Proven Integrated Package) ..... CALL
dBASE II & III (From Ashton-Tate) ..... $299/$375
KNOWLEDGEMAN (Version 1.06) $299
RBASE 4000 & 6000 (Enhance them w/CLOUT) ..... from $329
POWER BASE (Relational, hierarchical) $279
CIP (New and fantastic!) ..... CALL
DAYFLOW (New type of database) ..... CALL

NUTSHELL ..... CALL
LATTICE C COMPILER (Version 2.1) $299
DIGITAL RESEARCH (All products) ..... CALL
MICROSOFT (All products) ..... CALL
DOW JONES (All products) ..... CALL
IUS A/R, A/P, G/L $299
DECISION RESOURCES CHART MASTER $259
BPS BUSINESS GRAPHICS $259
Z-SOFT PC PAINTBRUSH w/FRIEZE GRAPHICS $99
PROKEY VERSION 3.0 ..... $65
SET-FX for your EPSON $45
NORTON UTILITIES $59
COPY II PC by CENTRAL POINT $35
COPYWRITE (Copies all IBM software) $45
COMPUSERVE STARTER KIT $35
SIDEWAYS by FUNK SOFTWARE $40
HAYES SMART COM II $65
CROSSTALK XVI by MICROSTUF $109
OZ (from Fox & Geller) ..... CALL
FLIGHT SIMULATOR $30
MASTER TYPE $30
BANK STREET WRITER $50
MATH BLASTER $35
WORD ATTACK $35

NEW IBM PRICES!!

IBM PC w/256K, 2 360K drives, controller, Monochrome Printer adapter, Amdek 310A $2195

IBM PC w/256K, 2 360K drives, controller, Color Graphics adapter, HX-12 color monitor $2495

IBM PC w/256K, 2 ½ ht. 360K drives, controller, 10MB hard disk w/autoboot $2995

(These systems are brand new, fully tested and burned in, fully warranteed for 90 days **AND ARE ALWAYS IN STOCK!**)

PROGRESSIVE MICRO DISTRIBUTORS

"IBM PC System Enhancement Is Our Business ...Personal Service Is Our Commitment."

FOR ORDERS ONLY

1-800-446-7995

for further information and technical support

1-404-446-7995

HOURS: 9AM to 9PM EST (Sat/Sun-12PM to 5PM EST)

7000 Peachtree Industrial Blvd.
Norcross, Georgia 30071

All prices are subject to change
IBM is a registered trademark of International Business Machines

NO SURCHARGE FOR MC/VISA

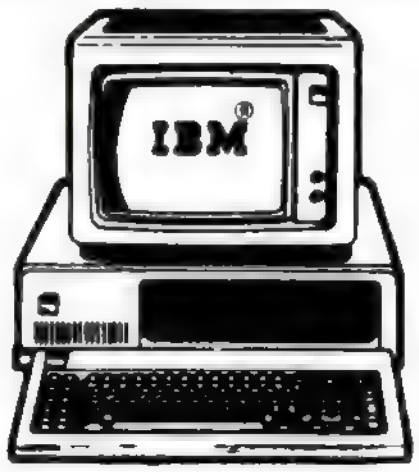
CIRCLE 366 ON READER SERVICE CARD

AMERICA'S NO. 1

IBM® Systems Specialists

WE CUSTOMIZE IBM PC SYSTEMS

IBM PC $1899
256K, two disk drives 360K each,
Drive Controller and Keyboard



IBMPC w/10MB $2599
256K, one floppy Drive, Keyboard
10 MB Hard Disk with Controller
BOOTS FROM HARD DISK Backup also available

ALL SYSTEMS ARE CONFIGURED AND TESTED AT NO EXTRA CHARGE

IBMPCw/30MB $3699
256K, one floppy Drive, Keyboard
30 MB Hard Disk with Controller
and Booster Power Supply
BOOTS FROM HARD DISK

★ PRICE WAR ★ CALL US LAST WITH YOUR BEST QUOTES ★

PRINTERS

EPSON RX-80 ....$259 FX-80 ....$429
RX-80FT ....$299 FX-100 ....$629
LQ-1500 Parallel ...$1,149 Serial $1199
LQ-1500 Tractor ....$50 Cutsheet feeder $399

OKIDATA 92P $399
93P $619
84P $749
INCLUDES PLUG & PLAY

JUKI 6100 Ltr Quality, 18 CPS, 13" wide $399
Tractor $129

NEC 2050 ....$799
3550 ....$1,499
PINWRITER P2 and P3 CALL

DYNAX DX-15 $399
Keyboard ...$149 Tractor ...$99 Sheet Feeder ...$199

BROTHER HR-25 ..$619 HR-35 ..$899
Tractor ....$119 Cut Sheet Feeder $199

DATA PRODUCTS **IDS PRISM** COLOR PRINTER
80 ....$999 132 ....$1199 OPTIONS ....CALL

ANADEX • DIABLO
QUME • TOSHIBA CALL

MONITORS

PGS MAX-12 Amber—Monochrome $179
HX-12—Hi-Res Color $449
SR-12—Super Hi-Res Color $599

TAXAN COLOR & MONOCHROME ....CALL

310A....$169 300A....$149 300G....$119

AMDEK COLOR MONITORS ..CALL

MODEMS

MICROCOM ERA 2 $359
PC Internal 1200 Baud w/software, 4 Yr. Warranty

HAYES SMARTMODEM 1200 Standalone .$469
1200B w/software $389

QUBIE Standalone ....$329 Internal $299

POPCOM Internal or Standalone ....CALL

NOVATION • ANCHOR
PROMETHEUS • RIXON
U.S. ROBOTICS CALL

P.O. & FOREIGN ORDERS
Call, write or telex for details

HARD DRIVES

TALL GRASS TECHNOLOGY
20 MB w/20 MB Backup $3,099
35 MB w/45 MB Backup $4,299
70 MB w/60 MB Backup $5,999

QUBIE 10MB $888

EVEREX 10MB ...$888

MAYNARD 10MB/30MB
10MB/WS-1 ....$888 10MB/WS-2 ....$1,029
30MB/WS1A ....$1999 30MB/WS-2A $2,099
WS-1 Gemini ....$1049 WS-2 Gemini $1149
"The Gemini" includes 10MB Hard Disk & Half Ht. Floppy

FLOPPY DRIVES

TEAC HALF HEIGHT 55B-DSDD $149
55F-QUAD $199

CDC Full Ht - DSDD $199
Half Ht. - DSDD $179

TANDON 100-2 $179
Full Ht. DSDD

★ SUPER SPECIALS ★

64K RAM Set of 9 chips $45

HAYES SMARTMODEM 1200 Standalone .$469
1200B w/Software $389

8087 CHIP $159

JUKI 6100 ....$399

MAYNARD 10MB/WS-2 ..$1,029

IBM PC Keyboard (original) ..$129

OKIDATA 92P $399
93P $619
84P $749
INCLUDES PLUG & PLAY

BROTHER HR-25 (23CPS) $619
HR-35 (36CPS) $899

KEYTRONIC
Deluxe Keyboard KB5151 $179

LOTUS 1-2-3/SYMPHONY
Will Call Only

NO SURCHARGE ON COD, VISA or MC — AMEX 5%

NETWORKING

ORCHID TECHNOLOGY
PC Net PLUS Starter Kit $899
PC netBlossom, PC turbo, PC netPlusRam ....CALL

CORVUS OMNINET
CALL FOR YOUR CONFIGURATION AND PRICES

MULTI-DISPLAY CARDS

PERSYST Mono OR Color $199
BOB Mono and Color ....CALL

Profit Systems **MULTIGRAPH** CALL

EVEREX Graphics Edge $399

TECMAR Graphics Master CALL

HERCULES Mono Graphics $329
Color Graphics $199

NEW **STB** Graphix Plus II $349

PLANTRONIC Color Plus $366

PARADISE Multi-display Card $299
NEW Multidisplay Card ....CALL

MULTI-FUNCTION CARDS

ORCHID TECHNOLOGY
Blossom - OK (to 384K) ....Best Price
PC net/upgrades ....CALL

NEW **QUADBOARD** 0-K (to 384K) $219

AST SIX PAK with 64K (to 384K) $249

EVEREX Magic Card w/software 0-K (to 384K) $199

MISC. ADD ONS

8087 CHIP $159
Math Software....$130 Both....$269

CABLE Parallel ....$20 Serial $25
Keyboard Extension, 6 ft....$10

BOOSTER POWER SUPPLY
ADDS POWER TO PC ....CALL

VERBATIM Datalife DSDD
Box of 10 ....$29

COMPUTER ACCESSORIES POWER DIRECTOR P2 $109
P12 $149

STANDBY POWER SUPPLY 200 WATTS....$279
300 WATTS....$379
Surge Protection, up to 30 minutes Standby Power

WILL CALL: Please call first for workorder number.

COMPUMAIL 805-498-6635

3541 OLD CONEJO ROAD, SUITE 102, THOUSAND OAKS, CA 91320 TELEX 888522 Ad #791

CIRCLE 234 ON READER SERVICE CARD

Index To Advertisers

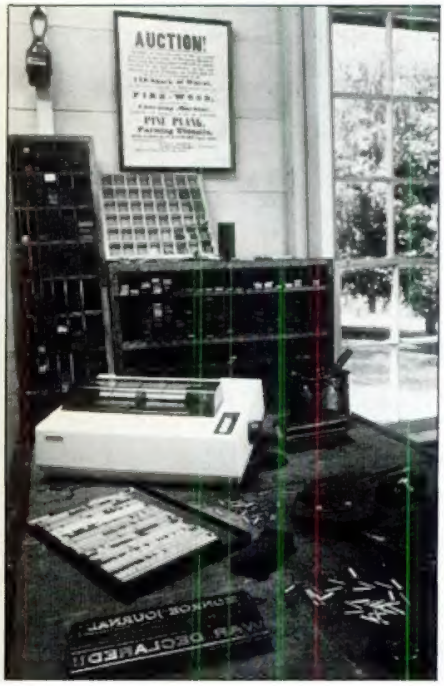
RS #	Advertisers	Page
105	Acton	170
102	AGS Management Systems	283
106	Alloy Computer Products	328
107	Amerisoft	404
109	Ameritec	166
110	Ampex	230-231
114	Anadex	22
126	Anderson Jacobson	88
116	Anex Technology	269
142	Applied Computer Products Inc.	46-47
108	Artic Technologies	291
221	Ashton-Tate	158
103	AST Research	292
104	AST Research	87
101	AST Research	114-115
*	AT&T Information Systems	195-197
118	Bank of America	59
139	BASF Systems	238
150	Blaise Computing Inc.	322
*	Borland International	21
*	Borland International	18-19
147	California Computer Systems	297
217	Carry On Systems Corp	383
125	CBS Educational & Professional	171
111	CDEX Corporation	344
112	Central Point Software	89
238	Chang Laboratories	236
239	CIA	92
113	Citizen American Printer	174-175
128	Coefficient Systems	148
182	Command Technologies Corp.	299
*	Compaq	11
228	Compu Add Corp	224-225
205	Compuclassics	392
234	COMPUMAIL	408
226	Compuserve Information Service	243
192	Computer Control	351
230	Computer Discount Products	338
115	Computer Hut of New England	65
183	Computer Mail Order	76-77
135	Computer Warehouse	398
123	Concentrics Data Systems	112-113
318	Connecticut Software	4
316	Connecticut Software	301
317	Connecticut Software	341
121	Contemporary Computerware	340
124	Corvus Systems	142
218	Cosmos	265
141	Cuesta Systems	405
*	Curtis Manufacturing	222-223
136	CX1	2-3
*	Cybernetics	200
140	Data Decisions	71
153	Dataproducts	198-199
176	Data Sources	323
219	Davong Systems Inc.	14
154	Decision Resources	8
155	Decision Resources	9
137	Dennison Computer Supplies	209
156	D F W Computers	374
307	Diamond Software	74-75
444	Digital Communcations Associates, Inc.	12-13
455	Digital Commuicatons Associates, Inc.	30-31
157	Discount Computer Centers	296
163	Disk Drives West	388
164	Disk Tech	350
143	Disk World	389
143	Disk World	330
143	Disk World	381
*	Diskette Connection	351
166	Diversified Computer Systems	350
161	DunsPlus	208
235	Eastern Enterprises	327
131	Economy Software	207
173	Electronic Arts	180-181
151	Elek Tek	385
175	Ellicot Software, Inc.	351
134	Enertronics Research	56
227	Everex Systems	43
180	Fidelity Investors	340
181	Flagstaff Engineering	332
197	47st Computer	146-147
306	Funk Software	94
188	General Data Communication Industries	152-153
132	General Technology	40
260	H&E Computronics	412
158	Harper & Row	104
145	Hercules Computer	5
146	Hercules Computer	61
129	Human Edge Software	216
222	Human Systems Dynamics	390
*	IBM Corp	257
231	IBM Corp	271-273
162	IBM ISG Division	295
334	IDE Associates	36-37
144	Ilar Systems, Inc.	404
199	Info Designs	99
198	Information Builders	275
225	Inmac	357
224	Intek	320
186	Interface	16
202	IOmega	70
168	Jameco Electronics	291
220	Kammerman Labs	264
275	Kensington Microware	108
243	Keytronics	290
172	Koala Technologies Corp.	157
296	Logicsoft	388
282	Logicsoft	308-310
295	Logicsoft	406

INDEX TO ADVERTISERS

RS #	Advertisers	Page
194	Lyben Computer Systems	340
263	Macola Inc.	350
386	Magnum PC	384
391	Mark Williams	96
432	Martin Marietta/ITSoftware	163
437	Maynard Electronics	38
290	MCP Applications	58
525	MDBS	154-155
204	MEF Environmental	337
160	Mercury Mega Bank	248
*	MicroComputer Acessories	44
165	Micro Design	156
167	Micro Design International Command/Assist	237
169	Micro Design International Disk Drive	405
216	Micro Exchange, The	312
171	Micro Exchange, The	26
315	Micro Flash Computer Systems	191
422	Micro Storehouse	342-343
341	MicroXpress	52
516	Microlog, Inc.	193
478	Micromart	20
159	Micromart	400-401
184	Microrim	172-173
*	Microsoft Inc.	17
*	Microsoft Inc.	69
*	Microsoft Inc	67
*	Microsoft Inc	106-107
326	Microstuf	318
331	Microware-see Microway	41
331	Microway	41
340	MLI Microsystems	340
208	MMTC LTD	406
359	Morning Star Systems	411
372	Mylex	217
349	NCR	24-25
342	NEC Information Systems	53
454	Networx	183
120	Northeastern Software	324
346	Norton Utilities	337
268	Nostradamus	98
357	Office Solutions	23
467	O'Hanlon Computer Systems	289
471	Omicron	28
412	Orchid Technology	249
351/352	Oryx Systems, Inc.	138-139
540	Pal Software	270
177	Panasonic Industrial	90
*	Paradise Systems	110-111
310	PC Brand	254-255
339	PC Connection	184-187
360	PC Link	321
535	PC Network	82-85
179	PC's Limited	352
499	PC Warehouse	294
365	Persoft	300
530	Physical Sciences Inc	336
*	Potomac Pacific Engineering, Inc.	350
209	Powerbase Systems	302-303
309	Prentice Hall	97
299	Princeton Graphic Systems	32
453	Primavera Systems	313
374	Professional Software	68
366	Progressive Micro Distributers	407
203	Quadram	27
333	Qubie Distributing	205
383	Qubie Distributing	165
493	Quest Research, Inc.	29
201	Quimax	317
189	Readiware Systems Inc	357
396	RP Marketing	86
443	RTCS Corp	299
*	Safeware	385
149	Satellite Software International	10
370	Seequa	55
211	Seiko	333
*	Softline	79
514	Softstyle	301
122	Softech Microsystems	1
522	Softronics	316
212	Software Arts	179
213	Software City	91
191	Software Group, The	314-315
195	Software Services of Tampa	326
196	Software Support	334
497	Spectrum Software	73
119	Spies Labs	380
430	STB Systems Inc.	C-3
431	STSC	242
*	Sysgen	80
461	SysteMate, Inc.	45
501	Tecmar Inc.	C-2
502	Tecmar Inc.	C-4
170	Telasoft	164
223	Televideo Systems	274
*	Texas Instruments	279
505	3M Data Recording Products	304-305
462	Toshiba	239
533	Transend Corp.	203
215	Tripp Lite	301
498	U.S. Robotics Inc.	287
190	Unipress	72
138	Ven Compass	78
130	Vertex	357
178	Vista Computer Co. Inc	206
193	Wadsworth Professional Software	331
402	Walonick Associates	298
*	Warehouse Data Products	100
415	Warner Software	306-307
240	Western Union Corp	210
185	Winterhalter Inc	63
*	XY Quest Inc.	391
206	Z Soft	281

The Independent Guide to IBM Personal Computers

Coming Up



Printer Roundup

Everything you always wanted to know about printers—and more—will be covered in a special expanded issue. Eighteen top *PC* authors will review, measure, and examine 119 printers, including fully formed character printers, dot matrix printers, ink jet printers, color printers, and new laser and thermal printers. In addition, we'll take a look at typewriters that can work as computer printers and printers that can work as typewriters. Each printer will be reviewed individually, and the editors will choose their favorites in each category. All will be tested for speed, print quality, noise level, PC-compatibility, and graphics capabilities. Enlarged print samples will let you examine each printer's quality. Tables for each category of printer will allow you to make the best-informed printer comparisons ever!

If you want to know how to get more out of your printer, how to buy one, how to use one, or how printers work, you'll find an article here. Our User-to-User and PC Tutor columns will be filled with handy printer tips. Professional columns will examine how color printers can be used in business writing to produce dazzling charts and graphs. Attorneys will learn how their practices can benefit from high-quality and draft printers. Science writers will find out how printers can fulfill their special requirements. Best of all, we've uncovered some real printer sleepers—printers you may never have heard of, but which do their jobs surprisingly well and at a favorable price/performance ratio.

PC-Compatibles

PC, Volume 3 Number 24, will offer a look at the latest crop of PC-compatibles. Stephen Kanzler and Leslie Brown will dissect the latest offering from Ericcson. Alfred Poor and Robin Webster look at the Hewlett-Packard. Bill Machrone reviews the Compaq Deskpro. The NCR and Stearns will be reviewed by David Obregón, while Craig Stark examines the ITT and Paul Somerson checks out the AT&T. In addition to reviewing each machine on its own merit, we will test all of them for their ability to run standard IBM PC software, including *dBASE II*, *1-2-3*, *WordStar*, and *Flight Simulator*, and we'll compare their speeds against that of the PC.

Professional tools for the software developer and business system user.

ProLibrary
Professional C Compiler Tools
These tools go beyond access to ROM Video and DOS 2.0 functions. Tools to write 8088 interrupt handlers and DOS 2.0+ device drivers. Flexible segment: offset addressing functions. DOS 2.0+ path handlers, set environment, run-time batch commands, and execution executive. DOS 3.0 upgrade. Lattice 2.0 compatible.

ProBatch
Professional Batch Tools
Sophisticated batch commands to control job execution. chmod to change or display file attributes. when to control job execution by time, day or date. ifset/switch/case to control job execution sequence. pr for flexible file printing. mount to access floppy disks by volume id. Many other powerful batch commands. All commands may be piped. All commands use 2.0 path. All commands controlled by set environment.

ProScreen
Professional Screen Manager
Editor for creation and management of screens. Screen storage in file or in program. Data entry screens, menus, windows and on demand help. Forms and box generation. On screen buttons and graphic/mono icons. Mouse and light pens supported. Run-time access by LINK library or by interrupt function.

ProLibrary (Includes Source) $200.00
ProBatch $200.00
ProScreen $300.00
ProScreen (with C Source) $450.00
MicroSoft C Compiler $400.00
Lattice C Compiler $400.00
Shipping & Handling Additional/ VA Residents 4% Sales Tax/ MC/VISA COD/ Check-OK

(703) 425-6422
Dealer Inquiries Welcomed

MORNING STAR SYSTEMS, INC.
9202 Alyssum Way
Annandale, VA 22003

TM

CIRCLE 359 ON READER SERVICE CARD

Copyrighted material

Introducing the Most Powerful Business Software Ever!

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • XEROX™

The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

VERSARECEIVABLES™ $99.95

VERSARECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSARECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSALEDGER II™ and VERSAINVENTORY™.

VERSAPAYABLES™ $99.95

VERSAPAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSAPAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSAPAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

VERSAPAYROLL™ $99.95

VERSAPAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSALEDGER II™ system.

VERSAINVENTORY™ $99.95

VERSAINVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSAINVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSARECEIVABLES™ system. VERSAINVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

VERSALEDGER II™ $149.95

VERSALEDGER II™ is a complete accounting system that grows as your business grows. VERSALEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSALEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSALEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSALEDGER II™ manual will help you become quickly familiar with VERSALEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

CIRCLE 260 ON READER SERVICE CARD

SATISFACTION GUARANTEED!

Every **VERSABUSINESS™** module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any **VERSABUSINESS™** module, you may return it within 30 days for a refund. Manuals for any **VERSABUSINESS™** module may be purchased for $25 each, credited toward a later purchase of that module.

To Order:

Write or call Toll-free (800) 431-2818
(N.Y.S. residents call 914-425-1535)

- add $3 for shipping in UPS areas
- add $4 for C.O.D. or non-UPS areas
- add $5 to CANADA or MEXICO
- add proper postage elsewhere

DEALER INQUIRIES WELCOME

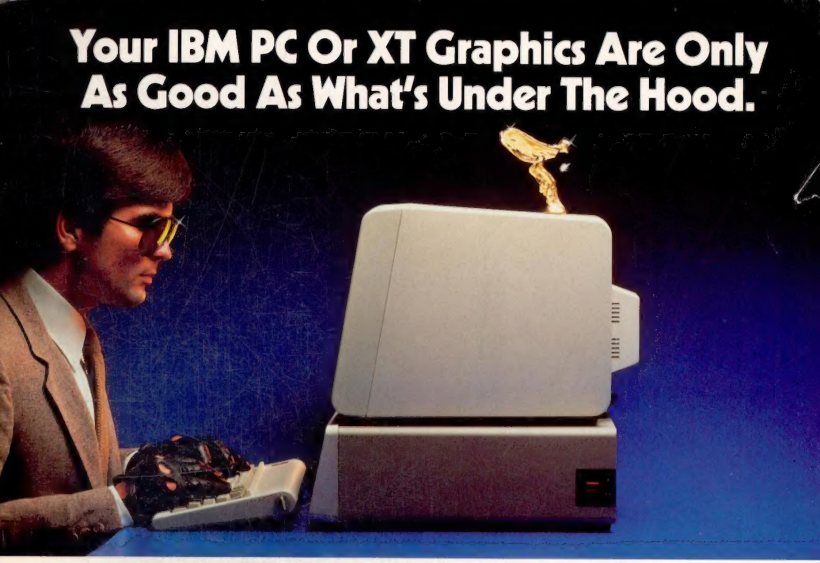
All prices and specifications subject to change / Delivery subject to availability.

COMPUTRONICS INC.

50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. - *APPLE is a trademark of Apple Corp. - *IBM is a trademark of IBM Corp. - *OSBORNE is a trademark of Osborne Corp.
*CP/M is a trademark of Digital Research - *XEROX is a trademark of Xerox Corp.

Your IBM PC Or XT Graphics Are Only As Good As What's Under The Hood.



Get Smooth Clean Performance With Graphix Plus II™. *Single* Board Support Of Both Color *And* Monochrome Display.

When it comes to color/graphics adapter boards, your IBM Personal Computer—and you—deserve only the best. That's why Graphix Plus II gives you outstanding graphics...*and* a whole lot more. With Graphix Plus II, you'll get *50% faster, flicker-free* scrolling over IBM's color/graphics board. And, the Graphix Plus II is the *only* product on the market which provides *dual monitor support* for both RGB color and monochrome graphics on a single board. It gives you *full screen* (640 × 352) monochrome graphics and *high resolution* color graphics with the appropriate software. When two monitors are used, Graphix Plus II *automatically* shifts to the appropriate screen.

Luxury Items Are Standard Equipment

With the Graphix Plus II, you'll be glad to know extra conveniences come standard. For example, you get a parallel printer port which allows you to hook up any IBM compatible printer or SASI compatible hard disk controller. Our 'PC Accelerator'™ software is included which gives you the use of *two* RAM disks and a print buffer. Plus, you can access the screen RAM with absolutely no "snow" or flashing. Graphix Plus II also provides true gray scale display on composite video monitors, a light pen interface, 32K display RAM (text and graphics modes), compatibility with Lotus 1-2-3™ and other popular software packages. And much more. A battery operated clock calendar is available as an option.

Puts You In The Driver's Seat

Graphix Plus II fits easily in any expansion slot inside your PC. And when you power up, you'll *see* the same high-powered quality you've come to expect from your machine. Incredibly smooth, versatile performance. From start to finish.

Graphix Plus II. So good, so reasonably priced, you might say...we've *outclassed* the competition. See your local dealer for all the details. Or call or write STB Systems, Inc., 601 North Glenville, Richardson, Texas 75081 (214) 234-8750.

STB™
STB Systems, Inc.

Expanding Microcomputing

IBM PC, XT are registered trademarks of International Business Machines Corporation.
Lotus 1-2-3 is a registered trademark of Lotus Development Corporation.

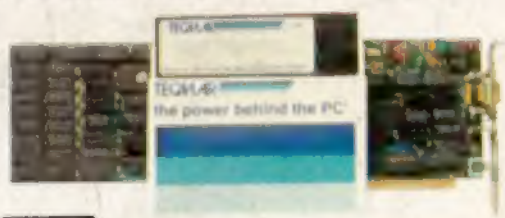
PC Accelerator is a registered trademark of ResiCorp.

CIRCLE 430 ON READER SERVICE CARD

Copyrighted material

Now make your PC paint.

Make it draw. Shade. Color. Erase. Create perfect circles. Ellipses. Rectangles. With the touch of a button. Print on screen and off in a variety of type fonts. Gothic. Roman. Old English. Script. Print in light. Medium. Bold. Italicize. Underline. Outline. Kern. Make it print in a wide range of point sizes. Make it cut. Make it paste. Make it all happen in one package. With Tecmar's Graphics Master™ Board and PC Paintbrush*Software.



Make a trip to your dealer for a demonstration. Or, make a call to Tecmar for the dealer nearest you. (216) 349-0600.

Tecmar
THE POWER BEHIND THE PC

*Registered trademark of the ZSoft Corp.

CIRCLE 502 ON READER SERVICE CARD

Copyrighted material